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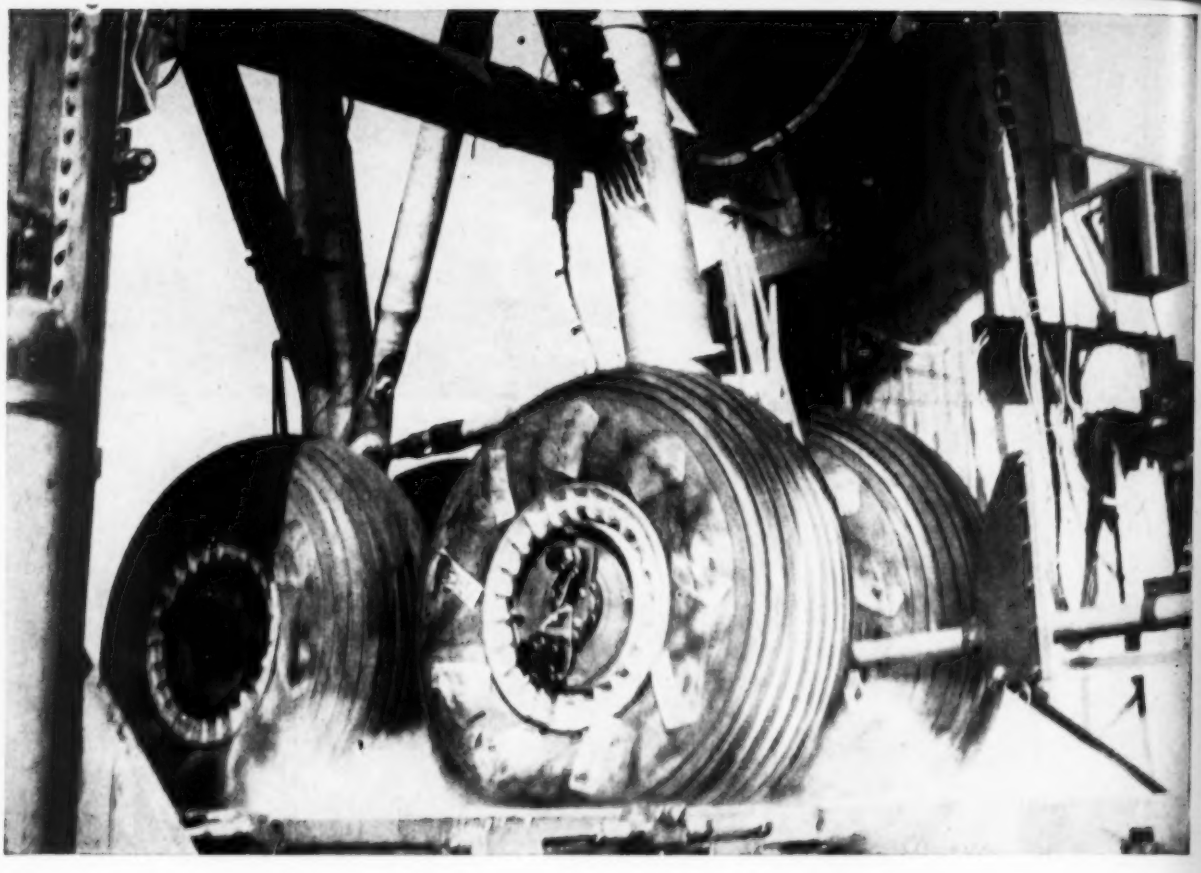

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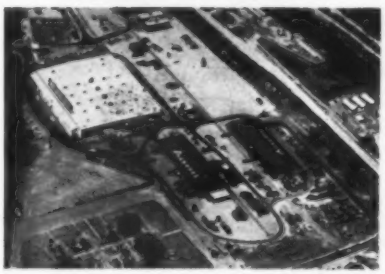

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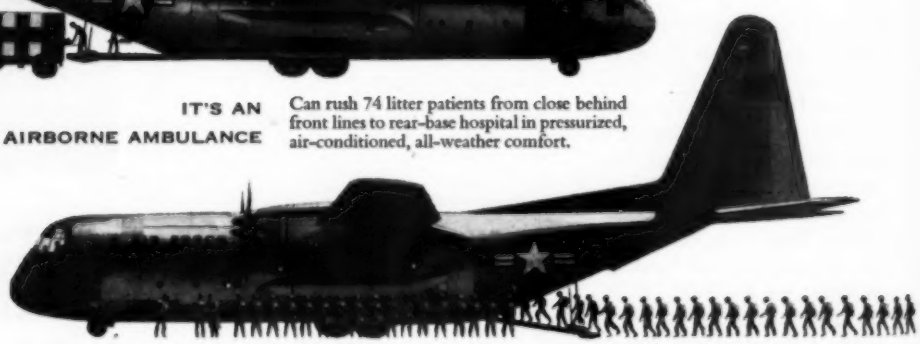

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Personal View

By WAYNE W. PARRISH

One Million Censors vs. Liberty

There is no more unjustified confusion and no more of a threat to the liberty of the American people than the present system of clamping down on legitimate government information.

There are certain secrecy steps which must be taken in the interests of national security but there is no sensible standard or pattern established between what is *real* security and what is hidden for administrative convenience.

At least *one million persons* within the military establishment alone can originate classification of documents. This is one out of every 165 inhabitants of the entire country.

This is an appalling fact. We in the U.S. scorn the Iron Curtain, but as *The Washington Post and Times Herald* expressed it, we have a Paper Curtain drawn between our federal government and our own people.

Just what is secrecy, after all? Any foreign government can obtain just about everything it wants in peacetime if it sets itself to the task. The Soviet Union with its effective espionage and information-gathering facilities has found few difficulties in its path. It has been notoriously successful in operating and controlling propaganda units inside the U.S. to protect such facilities.

We have never yet found an intelligent representative of the U.S. government abroad who did not believe that it is smarter to display openly what we have rather than to try to cover it up. This goes for our own people stationed behind the Iron Curtain.

It isn't just a matter of fooling ourselves by abortive secrecy clamps. Secrecy can be dangerous to our security. Just look back at Pearl Harbor. Secrecy seriously delayed the development of radar. Both technical and tactical programming were held up with the result that radar failed to prevent Pearl Harbor because of military ignorance on the spot. This single lesson should have taught us a lot, but it didn't.

The American people owe a debt of gratitude to Congressman John E. Moss of California whose subcommittee on government information has been hard at work taking testimony and making detailed studies of the enormous government machinery which is blocking the proper flow of news to press and public.

During the appearance of Trevor Gardner, former Assistant Secretary of the Air Force for Research and Development, Mr. Gardner testified as follows:

> ***MR. MOSS:** You indicated in your opinion about a million persons can now classify?*
> ***MR. GARDNER:** I am sure it is more than one million because there are several systems of classification. There is the industrial security system, and documents originating within industrial organizations who have government contracts can be classified by their originators. Within the military establishment, I am sure there are at least one million people who can originate classification of documents.*

The classification of information has become a colossal mess. What's behind it all?

From one informed source we have been told that some of the source of the trouble is within the White House itself. No less a personage than President Eisenhower, on reading a newspaper or some other printed material, gets on the phone and calls Defense Secretary Wilson and orders clampdowns on this topic or that. Having had orders from topside, Mr. Wilson duly presses buttons and issues orders up and down the line that there is too much leakage.

The net result is shudderings and tremblings all the way down the line. The real heroes are the lower echelon military officers who have to deal with press and industry and who catch the blows from all sides. In more instances than not the clampdown directives are in general terms. There is no one who can determine what can and cannot be released.

Recently this publication had an experience quite typical of today's confusion. A particular Air Force command took exception to a semi-technical article which had been assembled primarily from printed papers. There was nothing in the article that could be considered classified from any existing standard. The particular company involved had been meticulous in approving all of the subject matter. Yet this AF Command, acting on its own, tried to make it tough for many concerns involved in the subject by exercising still more stringent secrecy even as to advertising copy, which frequently is an important means of transmitting useful information throughout the industry. The Command isn't to blame primarily; it is the confusion in the Defense Department that creates the problems below.

There is no doubt that important developmental matters are being delayed because of current secrecy clamps. More than one group of scientists has rejected contracts because of restrictions. A free flow of information is needed for proper exchange of ideas and accomplishments. If the U.S. is afraid of what a foreign power might learn, it should remember two things. One is that a foreign power determined to learn secrets can succeed. The other is that it takes more than learning to produce. The greatest scientific and industrial complex the world has ever known should stop being afraid of ghosts.

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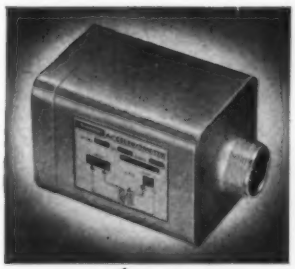

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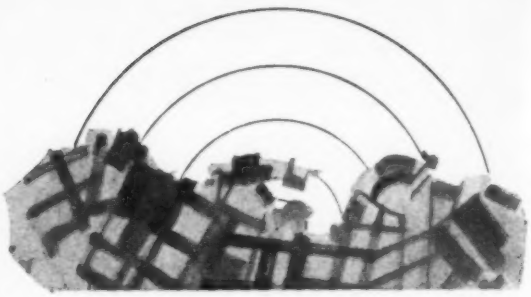

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Washington Report

Bases vs Long Range Bombers

Defense Department is taking a long second look at its global system of bases, particularly those of Strategic Air Command. Big question being asked in case of each base is: "How much is it worth to us in cold cash?"

Two basic yardsticks are being applied:

• **Changing range,** speed and effectiveness of retaliatory aircraft and missiles such as B-52, ICBM, etc.

• **New climate** of world public opinion in face of Russia's "sweetness and light" tactics.

U.S. bases now are viewed less as a safety guarantee, more as a lucrative source of income for foreign countries.

Pentagon planners are not wedded to the idea of holding these bases at all costs, and the outcome of this examination could materially affect future missile and aircraft development and procurement policies.

For example, U.S. contract for Moroccan bases is with the French. But it's virtually certain that in the near future supplementary negotiations will have to be held with new semi-independent Moroccan government. If the "rent" demanded is too high, U.S. is prepared to pull out. This would almost certainly mean giving serious consideration to placing greater procurement emphasis on big bomber range and/or aerial refueling systems.

• **Negotiations** now under way with Saudi Arabia over massive USAF base at Dahran are expected to set future patterns. Opinion still is divided in the Pentagon on just what form future base-leasing arrangements should take. But one conviction is universal: "We're not going to be blackmailed."

Saudi Arabian base talks have dragged because U.S. negotiators figure Arabs have been demanding too high a price: "If we give in now, it will be impossible to bargain later when we get down to cases in Morocco and elsewhere."

Inclination at Pentagon is to replace present vague system of grants-in-aid (both military and economic) in payment for bases with clearcut business-like lease on a specific piece of real estate, thus separating political and military programs more clearly. Host countries like it better the other way.

Hydrogen, Helium and Fusion

There may be more than casual significance to aviation in Atomic Energy Commission's reference to a controlled Helium-3 fusion in its latest semi-annual report.

While hydrogen fusion produces intense neutron fluxes, helium apparently does not. Considering the weighty shielding problem, massive air flow requirements and toxic/radioactive danger in case of crash of a nuclear-powered aircraft, this fact is significant.

Says AEC: "It is conceivable that a controlled thermonuclear reactor (burning a fuel of Helium-3, for example) might eventually be developed which would produce no neutrons at all, and for which no neutron shielding would be required."

Neither would the fusion engine be limited to atmospheric operation. Instead of mass air flow, it would rely solely on direct energy of reaction (like a rocket) for propulsion.

From a safety standpoint, fusion fuel would be separately stored and incapable of reacting without prior, metered introduction into the firing chamber. Nor would there be any fissionable products to contaminate the countryside in event of an accident.

Big problem: Containing the 100-million-degree Centigrade heat of reaction. This may be solved with electric and/or magnetic fields for insulation.

Final Tacan/DME Words

National Business Aircraft Assn. apparently got itself in a bind as the Tacan DME dispute was being brought to a close. A letter released on eve of the ACC decision, signed by president Henry Boggess, charged that civil aviation was "being crucified on a military Tacan cross." It was followed shortly by a telegram congratulating ACC Chairman Louis Rothschild on the VORTAC plan, which "insures a definite decision."

"Tacan cross" letter also created an air of warfare with ATA, which NBAA singled out for its "vacillating position," creating a "major doubt" as to the airlines' present endorsement of Tacan.

ATA's Milton Arnold rebutted indirectly by notifying Rothschild that its (ATA) endorsement "was reached after careful and detailed consideration by a well-qualified operational and technical committee." He paved the way, however, for a hotter answer to NBAA by adding that ATA would not engage in a non-classified discussion until the government had acted and made public its decision.

Why CAB Seeks Overseas Fare Cut

Behind Civil Aeronautics Board's repeated calls for reduced transatlantic tourist fares are staff studies showing that a 10% increase in seating densities would permit a cut of approximately $35 in basic one-way New York-London fares, with no reduction in earnings.

Present N.Y.-London fare is $290 one way. CAB figures the 75-seat limit on DC-7 aircraft could be increased to 82 seats, fare cut to about $265. Constellation maximum of 77 seats could be increased to 85 with a similar fare cut.

If domestic seating densities were applied to overseas flights, Board figures show a cut in fare to about $255 would be possible.

Goal for Reserves: 100% Readiness

Air Force says the reason it changed the status of 300 pilots, navigators and other airline personnel assigned to active AF Reserve and Air National Guard units to non-paid reserves is to assure that the ready reserve will have 100% capability in event of war.

In a directive to Continental Air Command, USAF says:

"The first impact of any attack against the United States must be borne by active and reserve mobilization forces in-being at that time. Recognizing this fact, it can also be understood that the civil air transport industry with all its facilities will not only be required to meet specialized military needs but to maintain an adequate civil air transport system as well."

Thinking behind the directive is that airline personnel could claim deferments to fill CRAF or civil transport needs in event of war, would not be available for combat units.

Sprints from deck to stratosphere

His beat is the oceans of the world. His job, to challenge unknown intruders on our defense perimeters. A Navy pilot is a seagoing sentry on 24-hour duty.

A major role in this job of positive interception—and as far from our shores as possible—is being assigned to the Douglas F4D Skyray. Less than a minute after leaving the deck, Skyray can soar past the 10,000-ft. mark. Seconds later it's hissing through the stratosphere . . . 35,000 feet up . . . at the ready with rockets and cannons.

This rate of climb comes as no surprise. Skyray also holds the world's official F.A.I. sea level speed records for the 3- and 100-kilometre courses.

Douglas F4D Skyray—fastest carrier-based interceptor. Performance of agile Skyray continues the Douglas tradition of "faster and farther with a bigger payload." Yet performance figures are meaningless without a skilled pilot at the controls. If you are interested in a career as a Naval Aviator, write Nav. Cad. Washington 25, D. C.

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When & Where

SEPTEMBER

Sept. 9-11—International Northwest Aviation Council convention, Boise, Ida.
Sept. 10—Pratt & Whitney-Southwest Airmotive Co. engine forum, Melrose Hotel, Dallas.
Sept. 13—Airwork-Pratt & Whitney Aircraft engine operation and maintenance forum, Miami, Fla.
Sept. 14-15—Conference on Communications, Roosevelt Hotel, Cedar Rapids, Iowa.
Sept. 17-21—11th Annual Instrument-Automation Conference and Exhibition, Coliseum, New York City, N. Y.
Sept. 17-21—Annual general meeting International Air Transport Assn., Edinburgh, Scotland.
Sept. 18—Third Air Navigation Conference, Montreal.
Sept. 18-20—Twenty-Fourth USAF-Aircraft Industry flying safety conference, Santa Barbara, Calif.
Sept. 24-26—American Rocket Society, fall meeting, Hotel Statler, Buffalo, N. Y.
Sept. 25-29—International Association of Aircraft Constructors jet transport conference, The Hague.
Sept. 25-30—Second European Aeronautical Congress, Kurhaus Hotel, Scheveningen, Netherlands.
Sept. 29—USAF Class 41-G reunion, Officers Club, Boiling AFB, D. C.

OCTOBER

Oct. 1-3—National Association of State Aviation Officials annual meeting, Lake Placid, N. Y.
Oct. 1-3—National electronics conference and exhibition sponsored by AIEE, IRE, Illinois Institute of Technology, Northwestern University and University of Illinois, Hotel Sherman, Chicago.
Oct. 1-3—Canadian IRE convention and exposition, Automotive Building, Exhibition Park, Toronto, Canada.
Oct. 2-4—1956 Aircraft Spark Plug and Ignition Conference, sponsored by Champion Spark Plug Co., Secor Hotel, Toledo, Ohio.
Oct. 2-6—SAE National Aeronautical Meeting, Aircraft Production Forum and Engineering Display, Hotel Statler, Los Angeles.
Oct. 3-5—Seventh annual National Airports Conference, University of Oklahoma, Norman, Okla.
Oct. 7-9—American Helicopter Society western forum, Adolphus Hotel, Dallas.
Oct. 8-10—Second annual symposium on aeronautical communications sponsored by IRE, Hotel Utica, Utica, N. Y.
Oct. 10-12—SAE National Transportation Meeting, Hotel New Yorker, New York.
Oct. 10-12-16—NACA triennial inspection, Langley Aeronautical Laboratories, Langley, Va.
Oct. 13-20—Eighth Annual All-Texas Air Tour, headquarters Walton Bldg., Austin, Tex.
Oct. 15-17—Radio - Electronics - Television Manufacurers Assn., radio fall meeting, Hotel Syracuse, Syracuse, N. Y.
Oct. 15-19—Second annual world-wide conference of USAF flying safety officers, Keesler AFB, Biloxi, Miss.
Oct. 16-18—Conference on magnetism and magnetic materials, sponsored by IRE, AIEE, APS and AIMMEE, Hotel Statler, Boston.
Oct. 22-23—Radio Technical Commission for Aeronautics fall meeting, Hotel Marriott and CAA Technical Development Center, Indianapolis.
Oct. 23-25—National Business Aircraft Association 9th annual meeting and forum, Miami, Fla.
Oct. 25-26—Aircraft Electrical Society annual display of electrical equipment, Pan-Pacific Auditorium, Los Angeles.
Oct. 29-30—Third annual East Coast Conference on Aeronautical and Navigational Electronics, sponsored by IRE, 8th Regiment Armory, Baltimore.

NOVEMBER

Nov. 1-3—National Aviation Trades Association annual convention, St. Louis.
Nov. 8-9—SAE national fuels and lubricants meeting, Mayo Hotel, Tulsa, Okla.
Nov. 14-15—Aircraft Industries Association export conference, Miami Beach, Fla.
Nov. 22—FITAP 10th annual general assembly, London.
Nov. 25-27—Aircraft Dealers & Mfrs. Assn., twenty-eighth meeting, Drake Hotel, Chicago.
Nov. 25-30—American Rocket Society annual meeting, Henry Hudson Hotel, New York City.

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The new B&H TAKCAL incorporates a refinement of the frequency meter principle. It operates in the low (0 to 1000 cps) range, reading the frequency of the tachometer generator on a scale calibrated in percent RPM corresponding to the engine's RPM. In addition, the TAKCAL checks the tach system. The TAKCAL circuit and tachometer are parallel so that readings can be made simultaneously to determine the accuracy (or inaccuracy) of the aircraft's tach system. The TAKCAL operates during the engine run to properly set up engine controls for maximum economy and safety.

The TAKCAL's component parts are identical with those used in the J-Model JETCAL Analyzer. They are here assembled as a separate unit tester and for use with all earlier models of the JETCAL Tester.

The TAKCAL operates accurately in all ambient temperatures from −40°F. to 140°F. Low in cost for an instrument of such extreme accuracy, it is adaptable to application in many other fields.

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Industry News Digest

Tacan Becomes Civil-Military Navigation System Under New Policy Set by ACC

The Tacan-DME dispute was brought to a conclusion last week as the Air Coordinating Committee adopted a new policy calling for the integration of Tacan into the common system. The distance measuring portion of Tacan will be incorporated with present VOR for civil use, while the military will continue its implementation of the full Tacan system for tactical purposes.

The new short-range navigation system, christened VORTAC, will be integrated into the navigation system to provide distance service for jet transports by July 1, 1959. CAA will install 295 of the clear-channel Tacan distance measuring stations by that date, while the military has 181 Tacan stations in various stages of installation which will also be integrated into the Federal airway and control system.

Present DME can be continued until 1960 except, ACC stated, "as a frequency or other conflict makes this impractical." CAA has been instructed to "establish a progressive decommissioning plan" for the civil DME. While more than 300 DME airborne units have been purchased by business aircraft operators, only about 123 are licensed for operation, it was revealed. The ACC declared that the "feasibility of replacing with VORTAC DME the airborne civil DME which has been purchased and installed in civil aircraft prior to August 30, 1956," would be studied.

However, at a press conference, ACC chairman Louis S. Rothschild said the possibility "is a slim one," and would be based on government determination on whether the users had obtained a satisfactory life from the units.

One conclusion reached by ACC is sure to cause a certain amount of consternation among user groups. While this conclusion guaranteed that VOR "will continue to be expanded as planned both at present and in the long-term future," another recommendation will be eyed warily: ACC proposed to consider a decision for "possible use" of the azimuth portion of Tacan "after this element of the system has undergone wide operational use in military operations, as well as civil in-service evaluation."

•To implement the VORTAC program, the government proposes to lend technical assistance in the development of a distance equipment for general aviation and other users. ACC also has instructed the NAV Panel to review the distance measuring requirements of general aviation and "recommend appropriate additions for clear-channel DME ground environment."

Ground installations will initially be made to provide distance measuring and improved air traffic control along jet transport routes for high altitude enroute and terminal operations. But the ultimate program calls for installation of 1,085 VORTAC stations throughout the U.S. which will provide national coverage by 1965.

Rothschild estimated that $65 million would be needed in fiscal 1959 and fiscal 1960 for implementation, with a contemplated expenditure of about $10 million for each of the next six or seven years. He further guessed that the airlines and civil aircraft users would invest about $3¼ million in airborne equipment in the 1959-60 period.

CAA is expected to have ground equipment specifications written early in calendar 1957. Possibility of seeking a supplemental appropriation when Congress convenes in January is definitely envisioned to launch the program. CAA, at this writing, intends to buy off the military specifications and modify and improve the equipment to fit its needs.

Airborne equipment for all classes of users is expected to be available within one to three years. Collins Radio, Stromberg Carlson, as well as Federal Laboratories are reportedly well along the TAC portion of the new VORTAC and Commerce spokesmen stated that "several other companies" have expressed a willingness to participate.

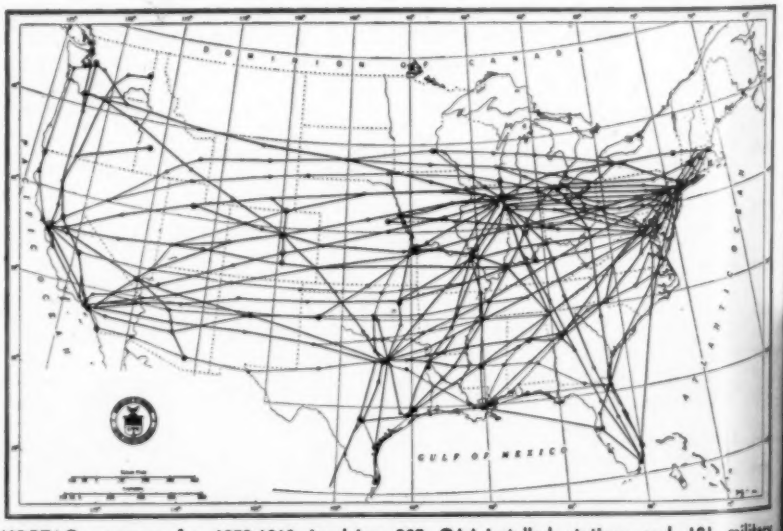
Twin-Jet Utility Plane To Be Built By NAA

A six-place twin-jet utility plane will be built by North American Aviation with its own funds to meet design requirements set forth last month by USAF's Air Materiel Command in its competition for a twin-jet pilot readiness trainer. Cost of prototype development and flight tests will be about $5 million.

The plane will be powered by two General Electric J85 jets (thrust unofficially set at 2,000 pounds each) and will have maximum gross takeoff weight of 14,000 pounds. Speed will be about 500 mph at 45,000 ft. cruising altitude. Length will be 43 ft. and wing span 42 ft. in a swept-back configuration. There will be space for a crew of two and four passengers.

Windtunnel tests and 25% of engineering work on the plane have been completed, and a mockup is expected to be ready next month. First flight of a prototype is scheduled for early 1958.

The trainer is one of two designs called for by AMC in its competition. The other is a four-jet utility transport capable of carrying a two-man crew and at least eight passengers.



VORTAC program for 1959-1960 involving 295 CAA-installed stations and 181 military installed stations is based on the first planned route structures of airline and military jets and other high-performance aircraft to be operated at 18,000 feet and above. The high performance aircraft will fly along the routes shown by the heavy black lines, with the dotted lines showing alternate routes. Either VORTAC or VOR and full TACAN will be installed as shown by the dots.

Navy Captures Speed Record with Crusader

Oklahoma City—The nation's speed record was captured by Navy for the first time when its Chance Vought F8U Crusader supersonic fighter won the Thompson Trophy with a speed of 1015.428 mph. Announced at the National Aircraft show, the record was made on Aug. 21 by Cmdr. R. W. "Duke" Windsor over a 15.1 kilometer course over China Lake, Calif. The previous record of 822 mph was set last year by USAF Col. Horace Hanes in a North American F-100C.

Other records established at the annual aviation Labor Day weekend event were:

• **Bendix Trophy** race with six F-100Cs ended with Capt. Manuel J. Fernandez, USAF, breaking the previous Bendix record of 616 mph with a new speed of 666.661 mph over a 1,120-mile course. The previous record had been set in an F-84 two years ago flying an 1,800-mile course.

• **General Electric Trophy** race resulted in a new speed record for the 1,900-mile course from Bermuda to Oklahoma City. The winner of the B-47 race flew the distance in three hours, eight minutes, 43.6 seconds for a speed average of 601.187 mph.

• **The Army** established a new prolonged helicopter flight record by keeping a Bell H-13 in the air at Will Rogers Field for 57 hours and 45 minutes. The previous record of 31 hours and 40 minutes had been established on August 24 incidental to the first helicopter cross-country refueling run.

Skyray Grounded

The Navy confirmed that it has grounded the Douglas F4D Skyray fighter because of difficulties with the fire seal between the afterburner and turbine sections of its J57 engine. It said a team from Pratt & Whitney Div. of United Aircraft Corp. is touring Navy installations to correct the defect. It added that some of the aircraft should be flying again by the beginning of this week.

CAA, Boeing Plan 707 Test Program

A three and one-half hour flight test program using the 707 jet transport prototype has been tentatively planned for late this month by CAA and Boeing Airplane Co. to get answers to some 20 air traffic control and operational problems in future jet operations.

Tests will emphasize jet operational characteristics under low visibility conditions and will include a number of maneuvers such as a go-around on an ILS approach, deviation from localizer course, etc., to gain factual jet data. Also included will be demonstrations of high altitude cruise to see how closely pilots can maintain assigned altitudes both in manual and automatic operation, an emergency descent, landing with simulated engine failure, etc.

AIA Denies Restrictive Personnel Agreement

Aircraft Industries Association said there has never been an agreement preventing member companies from hiring one another's engineers and other skilled employes.

To dispel "a mistaken belief on the part of some individuals" that an "anti-pirating" agreement did exist, AIA released a resolution passed by its board of governors at Williamsburg, Va. on May 24.

"The Association has consistently sought to indicate its disapproval of unethical recruiting practices and of action on the part of member companies tending to entice away or 'pirate' employes of other member companies and of industry generally," the resolution said.

"However, in advocating ethical recruiting and hiring practices the Association has not intended to encourage action . . . which would in any way limit or have an adverse effect upon employes seeking more favorable employment or, on the other hand, which would limit employers from hiring or offering employment to employes of other companies . . ."

Members should not knowingly pirate employes of other companies under circumstances which would lessen present or potential competition, AIA said, adding: "Members should make no agreements among themselves which would tend to limit the freedom of their employes in seeking more favorable employment, or their own freedom in hiring employes from other companies."

AIA Says It's Happy With Adm. Ramsey

DeWitt C. Ramsey will not seek extension of his contract as president of Aircraft Industries Association beyond July 1, 1958, because of health considerations, AIA announced.

Denying reports that the board of governors was unhappy with Ramsey and was looking for someone to replace him in November, AIA said it is "completely satisfied" with his leadership.

Joseph T. McNarney, chairman of the board of governors, said a committee has been appointed to screen candidates for Ramsey's successor. "This committee has been active with the full knowledge and cooperation of Adm. Ramsey," he added.

New Materiel Chief

Procurement and production of all USAF planes and guided missiles will be handled by Col. John L. Zoeckler, who has been named chief of the Aircraft and Missiles Division at Wright-Patterson AFB. He replaces Col. Carl F. Damberg, whose new assignment is

(*Continued on Page* 18)

First Production KC-135 Makes Initial Flight

Boeing's first KC-135 Stratotanker made its maiden flight August 31 at Seattle. Aircraft flew an hour and 19 minutes with A. M. (Tex) Johnston and R. L. (Dix) Loesch at the controls. First production version of four-jet tanker-transport series flew two months ahead of schedule.

GENERAL ELECTRIC JET ENGINES LOG 13,000,000th FLIGHT HOUR

Engine flight record matched by continually improved SFC, higher thrust, smaller frame-size engines—faster jet development

PERFORMANCE DATA OF 21,000 G-E ENGINES now in service, helped foster design concepts of J79. Above, G-E engineers compare J73, right, with advanced experimental engine.

LOW WEIGHT, HIGH THRUST OF NEW J79 helps make Lockheed F-104A, above, world's fastest fighter. J79 delivers more power per pound than any other jet of comparable size.

By last week, General Electric jet engines had logged 4,000,000 hours more flight time than any other U.S. jet engine manufacturer. And every hour since, G-E J47's and J73's, plus the first of the new J79's, have added the equivalent of another year and a half of flying time to the total.

Operating experience pays dividends in jet reliability. Five years ago, the J47's allowable time between overhauls was 150 hours. Today, J47-GE-25's installed in SAC B-47's are allowed 1700 hours, an increase in service life of 1130%. In the same period, the thrust of G-E engines has jumped—50% in the 9000-lb thrust J73, and even more in the new J79—while frame size has actually decreased. SFC has improved at an equally rapid rate.

Flight data helps speed jet progress. This engine flight experience has helped General Electric design engineers trim months from the development cycle of new engines. The J79, for example, was brought from drawing board to test cell an entire year ahead of the timetable formerly thought feasible.

Operational time of G-E jets continues to grow. The 21,000 General Electric engines currently in service provide an ever-increasing base of flight experience that promises still more powerful, more efficient jet engines for the U.S. aviation industry. General Electric Company, Cincinnati 15, Ohio. 235-10

ENGINEERS: Illustrated booklet "Thrust & Progress" is available for qualified engineers interested in the field of flight propulsion. Write: Technical Personnel, Building 100, AGT Division, General Electric Company, Cincinnati 15, Ohio.

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(*Continued from Page* 15)

Deputy Commander, Air Materiel Force, European Area.

For the past two years, Col. Zoeckler has been deputy base commander, Elmendorf AFB, Alaska. From 1950 through 1953 he was deputy director of procurement and production, Office of the Deputy Chief of Staff, Materiel, in Washington.

Defense Study Group Urges Less Red Tape

Stronger, more centralized military control of aircraft and helicopter development projects and less red tape and government supervision for contractors were two of the principal recommendations of the Aircraft Study Group set up by the Defense Department last year to find ways to trim lead time on aircraft development projects.

The Group, headed by Deputy Defense Secretary Reuben Robertson, Jr., also urged:

- More technical information for contractors.
- Faster action on contractor requests for government-furnished industrial equipment.
- More timely and better informed military policy decisions in the early stages of development projects.
- Greater Pentagon support for the National Advisory Committee for Aeronautics.
- Better compensation for small companies performing outstanding research and development work.
- Other steps aimed at improving military organization and procedures.

Robertson said the proposals "should result in reducing the present Air Weapons System time cycle," and one staff official expressed the hope that as much as 20% of present lead time could be eliminated. The Robertson group will remain in existence to review plans submitted by the military services to implement its recommendations.

Industry News Briefs

MANUFACTURING—MILITARY

• **Douglas Aircraft's** payroll now totals more than $8 million weekly, or a rate corresponding to $400 million yearly. Employment now tops 80,000, a peacetime high, and is divided as follows: Santa Monica, 23,514; El Segundo, 23,840; Long Beach, 20,521; Tulsa, 11,863; Charlotte, N.C., 505.

• **An Army H-21** Vertol helicopter completed what was called the first non-stop transcontinental flight by helicopter. The 2,610-mile flight, from San Diego to the Pentagon heliport, took 31 hrs. 40 mins. The H-21 was refueled twice from the ground while hovering and four times in flight from a De Havilland Otter UI-A using a hose reel device supplied by Flight Refueling Inc., Baltimore.

• **July exports** totaled 65 civil aircraft of 6,000 lbs. and under, valued at $1,057,145, Aircraft Industries Association said. This was 30% above July, 1955, in numbers and 68.4% in value.

• **Vertol Aircraft Corp.,** Morton, Pa., became the sixth company to receive a $35,000 Army contract to carry out design study of a "flying crane" helicopter capable of carrying up to 16 tons of cargo over distances of 10 to 100 miles. Other companies: Flettner, Kaman, Piasecki, Hughes Tool Co., and Hiller.

• **Boeing Airplane Co.,** Seattle, is now employing more persons than at the peak of World War II. Employment is at a record 45,500. There will be a continuing gradual buildup in the next two years.

• **Curtiss-Wright Corp.** raised the quarterly dividend on common stock from 55¢ per share paid in previous quarters to 65¢. Dividend is payable Sept. 28.

TRANSPORT

• **Air-India International's** request to buy three Boeing 707 jet transports for $24 million has been approved by the Indian government. Rolls-Royce Conway engines may be used. Planes will be used on India-London route and projected extension to U.S.

• **CAB found** there was nothing wrong with the main cabin door of a Piedmont Airlines' DC-3 through which a man fell to his death in June. CAB investigators drew no conclusions as to how the door came open.

• **Change in name** of Helicopter Air Service Inc. to Chicago Helicopter Airways Inc. was approved by company stockholders and by CAB.

• **Northwestern University** on Oct. 5 will open a Transportation Center on its Chicago campus, aimed at solving basic industry problems. The center was organized specifically to meet the need for a "fresh and integrated approach" to complex transportation problems. Program calls for a staff of 50 and eventual annual budget of $1.5 million.

• **Flight trials** are being conducted by Trans-Canada Air Lines and BOAC with a 35-lb. airborne teleprinter designed to give transatlantic pilots printed weather reports. Project is being sponsored by Nartel (North Atlantic Radiotelephone) committee, informal group representing U.S. and foreign airlines flying the Atlantic. Other lines sponsoring the trials are Pan American, TWA, Air France, KLM, Swissair and SAS.

• **British Overseas Airways Corporation** has $329,646 net profit for its fiscal year ended Mar. 31, 1956, and, by eliminating an accumulated deficit of $2.4 million, ended the year with $50,066 accumulated surplus—the first time in its history.

• **Col. John O. Colonna** has been named director of Baltimore's department of aviation, succeeding Gen. Donald H. Connolly, who retires Dec. 31. Colonna, who has been assistant director since mid-1955, takes over Jan. 1.

• **TWA** on Sept. 30 suspends one-plane flights between the U.S. west coast and Europe. Reason: disappointing traffic results. Company will resume west coast-to-Europe flights if it obtains a polar route. CAB's Bureau of Air Operations has recommended such routes for both TWA and Pan American.

• **Seaboard & Western Airlines** had earnings of $415,997 after taxes in first half of 1956 against $241,906 profit in same 1955 period.

• **Clifford Mutchler,** former manager of customer service for TWA, was elected president of Airwear Inc. and v.p. of Lyon Tailoring Co., of which Airwear is a division. Mutchler had been with TWA 27 years.

• **Russell L. Waganeck,** who resigned recently as Capital Airlines' maintenance manager, was named operations manager of Central Airlines.

Navy Gets Missile-Carrying Demon

McDonnell F3H-2M, newest version of Demon armed with Sperry Sparrow air-to-air missiles and rapid-firing 20 mm cannon, has completed all Navy trials and first aircraft are now entering squadron service. Like F3H-2N all-weather fighter, latest Demon is powered by a single Allison J71 jet engine.

Production Spotlight

• Air Force extension of the original Ficon B-36/fighter project is another modified B-36 capable of carrying three fighters, one at each wingtip and a third above fuselage. Hook-on and detachment of fighters is purely a flight maneuver. Project is called Tom-Tom and has been flown successfully by Convair-Ft. Worth.

• Production of the Cessna T-37A twin-jet Air Force trainer may total more than 400 aircraft. Company has announced $10-million four-phase expansion program at Wichita, first phase of which is aimed at taking care of increased T-37A production.

• Pay-off is near on the WS-110A chemically-fueled bomber, with Boeing and North American awaiting Air Force decision. USAF is pinched for R&D funds, however, and may have to decide on a priority between WS-110A and its nuclear-powered bomber and ICBM projects.

• Wright J65 turbojets will power the first eight Chance Vought Regulus II Navy missiles, but follow-on production vehicles will be fitted with GE J79s.

• Lockheed F-104A has gone considerably beyond its best operational speed of Mach 2.5, with result that engine suffered compressor damage. Aircraft reportedly exceeded Mach 2.8.

• AIA estimates cost of electronics equipment on three of today's medium bombers is about same as entire cost of a World War II bomber.

• Helicopter manufacturers had a midyear backlog of $472 million, with total sales for first half of 1956 amounting to $141.7 million.

• Flying "stovepipe" fighter in-flight refueling system developed for Air Force by Thieblot Aircraft Div., Vitro Corp., has passed preflight safety inspection and will fly soon. System is installed in a Republic F-84 at Baltimore Friendship International Airport.

• Vickers-Armstrongs is studying a turbojet version of the Vanguard. One configuration would have three jet engines in rear of fuselage. Production Vanguard will have four Rolls-Royce Tyne turboprops.

• Overhaul life of the GE J47 now is 1,700 hours. Half of the engines returned to GE before end of their overhaul lives go back because of foreign object damage. Of 4,715 J47s overhauled by GE to date, only 15 involved corrosion.

• If Convair can come up with 250 orders for its 880 jet transport, price will be reduced to $2,850,000 per aircraft.

• Boeing 707 jet transport prototype has logged more than 550 hours, 85% on engineering testing and 15% on demonstration flights.

• Capital Airlines expects overhaul life of Rolls-Royce Dart to go up to 2,000 hours within a year. Present life is 1,400 hours. Indications are that 90% of all Darts will reach 2,000 hours.

• High operating cost of supersonic aircraft may delay their use for commercial service several decades. Another disadvantage: very limited range.

• Navy is converting two merchant-type vessels as part of development of Fleet Ballistic Missile System, using Jupiter missiles. The Compass Island (EAG-153) is being converted at New York Naval Shipyard. Second ship (EAG-154, unnamed) is being converted at Norfolk, Va.

• Willy Messerschmitt will produce an aircraft of his own design, the Me 200 Pfeil jet trainer, in addition to the Fouga Magister under license. German company reportedly has orders for 20 Pfeils, prototype of which is to be built in Spain.

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Letters

In the Open

To the Editor:

I have noted with keen interest Lois Philmus' article on page 32 of the August 13 issue of AMERICAN AVIATION concerning the bogus parts which are manufactured by gyp manufacturers, and want to express my appreciation for bringing this out in the open.

It was a well-written article and certainly brought out all of the points which are dangerous to the flying public . . . Again, thanks for a swell job.

GEORGE W. JALONICK III
Southwest Airmotive Co.
Love Field
Dallas, Texas

Attention Mr. Dulles

To the Editor:

I look forward to each issue of AMERICAN AVIATION because it is one of the finest mediums of bringing to the aviation public the factual news, knowledge and know-how of aviation.

The depictions of your travels in the USSR have been extremely interesting and well written. So well written, in fact, it makes the reader feel he has made an extensive tour of the lands of the unknown at no cost to himself. Having traveled to many foreign lands, I can very well imagine your relief and joy in setting foot again on these good acres of freedom and opportunity in which God has been so gracious to us Americans.

Thanks for the fine trip and the comprehensive insight on how the peoples on the other side of the world feel towards us. You have indeed demonstrated the qualities of the fine ambassador.

JACK JAYNES
Fort Worth, Tex.

On Role of 'DERs'

To the Editor:

I was recently reading your article concerning the CAA's comment about the Designated Engineering Representatives (AMERICAN AVIATION, August 27) who will soon be displaced by CAA technical personnel.

Being a DER myself, I would like to inquire as to just how the CAA will obtain 110 or more technicians capable of replacing the DERs they have around the country now. I ask this question because we have been trying to hire some engineers and have been almost unable to do so except at some fabulous salaries, which we know the Civil Service does not pay. Also, where can they get men with experience and background other than through the DER system?

I would also have to agree on one statement made, and that is that the CAA has to monitor the data sent in by the DERs; but it is not the fault of the DERs, because the CAA does not seem to know just what it wants in the way of information and documents. Only recently have they been able to reach a mutual agreement among themselves as to just what they expect of a DER and could furnish him information in order that he can tell his customer just what he has to acquire from him in order to satisfy the CAA.

Another question that the CAA should answer is how can they have much better coverage or as good a coverage with these additional technicians than they have at present with DERs spread out all over the country.

You will probably find that the new CAA technician will stay at the "home-base" as much as they have in the past and it will be as difficult to get any assistance on a project in the future as it has been in the past. The DER program as set up could work very well if proper education of the DERs was accomplished by the CAA regions. A good question to the CAA would be: Do they think that they have properly indoctrinated the DERs to the point that they could handle all phases of the CAA work for which they are qualified?

Never before have I undertaken a job this large with so little training or assistance.

I offer this information simply as a mild rebuttal to the above-mentioned article since some of the DERs have been doing a good job and taking a considerable load off the CAA offices, which is just what the setup was intended to do. But now that we have geared ourselves in that capacity, a change takes place.

(Names withheld on request.)

Knew It All The Time

To the Editor:

The S.E.C. investigation re some imaginary leaks as to Northeast Airlines becoming third Miami carrier and the reaction of its stock prior to the awarding seems to indicate that they are sore because they were not in on a good thing.

The big giants need the investigations not the small items.

I, myself, three years ago made a wager that Northeast would eventually get the Miami run. I am also a small stockholder since 1946 and if I had any extra cash I would have loaded up on Northeast stock these past few years. I, being an airline employee, no extra cash.

The reasoning behind my thinking Northeast a sure thing was that Eastern and National Airlines would lobby for weak competition and not strong competition. I am amazed the smart money did not touch it.

CHARLES L. WOHLERS
Paoli, Pa.

Books

Air Transport Pilot Rating, *by C. A. Zweng and A. C. Zweng, Published by Pan-American Navigation Service, 12021 Ventura Blvd., No. Hollywood, Calif. 8th edition (completely revised); 354 pp. illustrated. Price $5.50.*

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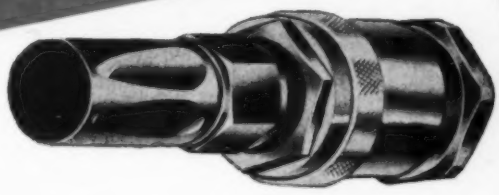

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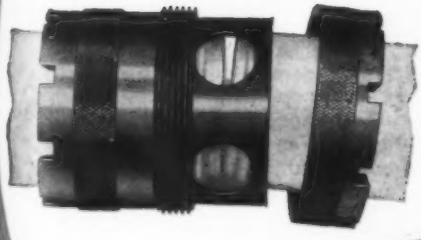

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Circle No. 11 on Reader Service Card

PENTAGON'S LATEST LIST of top 100 military contractors is dominated by aviation/missile/electronic suppliers. Companies principally active in this field nailed down the first 15 spots in the breakdown for calendar 1955. They accounted for more than 43% of the $15.3 billion in total military contracts awarded last year (see page 25).

●

FIVE-MAN COMMITTEE named by Defense Secretary Charles Wilson to evaluate technical merits of the competing Nike B and Talos antiaircraft missile systems isn't likely to settle the hot interservice dispute. The group, headed by missile czar Eger V. Murphree, may come up with the last word on technical aspects of the competing weapons. But it won't get to the heart of the trouble: the roles and missions struggle.

The Army won't rest until it gets a favorable revision of the present interservice missile agreement limiting it to antiaircraft missiles with maximum combat radius of 50 miles. And USAF will continue to struggle against Army ambitions, regardless of the qualifications of the weapons involved in the fight.

●

CAUTIOUS HINTS of possible force reductions continue to come from high civilians in USAF. Latest is from Undersecretary James H. Douglas: "It seems clear that we should not try to add a substantial missile force on top of 137 wings of manned aircraft." USAF is currently developing eight new nuclear delivery systems on top of the systems now in operation, he noted. They include the two ICBMs, the IRBM, the Snark and Navaho, B-58, WS-110A chemical bomber, and WS-125A nuclear bomber.

●

USAF VIEWS ON LIGHT FIGHTERS (10,000 pounds and under) may be changing somewhat. Heavy fighters are still favored for U.S. operational units. But USAF planners now believe that small craft like Northrop's twin-jet supersonic fighter and Britain's Folland Gnat may be the best answer to equipment problems in NATO and in other small countries. Pilot training, runway conditions, productive capacity and maintenance are factors affecting USAF's thinking.

●

THOUGH PRACTICAL SOLUTION to heat-barrier problems in missiles and hypersonic aircraft won't come easily, it's a good bet the final answers will border on the "exotic." It's obvious in possibilities now under test or consideration. To mention a few: coatings of diamonds, gold, platinum, iridium and silver; nickel-chrome alloy structures; skins that are crimped, and skins that are porous and exude cooling gases or liquids.

●

FAIRCHILD/FRYE CORP. TALKS on possible production by Fairchild of Frye F-1 Safari are reportedly proceeding without a hitch. Possible production location—Shawnee, Okla. Fairchild expects to take possession from Reconstruction Finance Corp. of tool plant there within a few weeks, will then decide on continued tool fabrication versus aircraft production for Frye.

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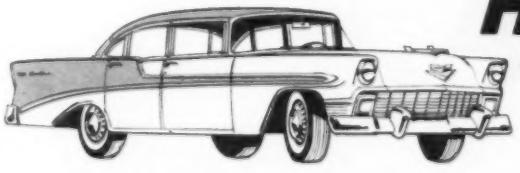

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Here's how flight personnel of the Hoover Company feel about De-Icers on their DC-3 (top right photo): "We can always depend on B. F. Goodrich De-Icers. They enable us to plan and complete trips we otherwise wouldn't even schedule."

And other executives are ordering B. F. Goodrich De-Icers as original equipment on new planes like the Aero Commander (top left), Beechcraft D50 (bottom left), and Cessna 310 (bottom right). Of course, De-Icers can be installed on existing planes, too.

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Circle No. 12 on Reader Service Card

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VOL. 20 No. 8

Here's the Breakdown on Air Defense Spending

U.S. poured $5,334,000,000 into aircraft and missiles last year; aviation firms held top 15 positions among 100 defense contractors.

By HENRY T. SIMMONS

SUPPLIERS OF AIRCRAFT, missiles and related items strengthened their hold on military procurement in 1955, taking over the first 15 positions on the Defense Department's list of the 100 U.S. corporations receiving the largest volume of contracts last year.

Altogether, 42 companies with a substantial role in the production of aircraft, missiles, aviation electronics equipment and related items showed up on the latest list. This was a net increase of two over the number of aviation suppliers listed among the top 100 contractors for the five and one-half year period between July, 1950, and December, 1955.

Total military obligations (counting contracts of more than $10,000 each) amounted to $15,286,600 last year, of which the top 100 contractors received $10,576,200,000. This was 69.2% of the total.

• **Aircraft and missile suppliers** garnered 34.9% of total contracts placed last year, or more than $5,334,000,000 in orders. This was more than half the value of contracts going to the top 100 suppliers.

For the five and one-half year period as a whole, the top 100 suppliers were awarded a grand total of $81,575,600,000 in military contracts. This was 62.7% of the $130,008,400,000 in awards of more than $10,000 each made by the services for the entire period.

• **Aviation contractors** accounted for 30.3% of total awards during the over-all period, or more than $39,392,000,000. This was just under half the value of contracts received by the top 100 companies during the period.

The slice of total military procurement going to producers of aircraft, missiles, electronic equipment and related items has generally been on the upgrade since the Korean War, despite a drop recorded last year.

In the three-year period between July, 1950, and June, 1953, aircraft and missile suppliers among the top 100 contractors received 27.3% of total U.S. procurement. This jumped to 42.1% of the total during the 18-month "readjustment" period following the Korean War (July, 1953, to December, 1954), then settled back to 34.9% of total awards for calendar 1955.

• **Despite substantial changes** in the companies making up the roster of top 100 contractors between the start of the Korean War and the end of 1955, aviation contractors generally held their positions among the top group once they achieved this status.

Only one aircraft company with a position among the top 100 companies for the over-all five and one-half year period failed to show up among the top 100 contractors in calendar 1955. This was Beech Aircraft Co. It stood in 61st place on the ranking for the entire period, with a total of $257.7 million in military contracts.

On the other hand, three new aircraft/missile/electronic suppliers showed up in the latest list that had not appeared on prior lists. They were Chance Vought Aircraft, Inc., Lear, Inc., and Sundstrand Machine Tool Co. ◈ ◈ ◈

How Aircraft, Missiles Firms Stand Today

Here is how aircraft and missile suppliers stood among the 100 largest defense contractors for both calendar 1955 and for the entire five and one-half year period between July 1, 1950, and Dec. 31, 1955: (Contracts expressed in millions of dollars.)

	Period of Jan.-Dec. 1955		July 1, 1950-Dec. 31, 1955	
Rank	Company	Contracts	Rank	Contracts
1	Boeing	797.2	2	5,956.9
2	North American	790.9	6	3,631.0
3	General Dynamics	781.7	7	3,516.9
4	United Aircraft	587.2	3	4,464.9
5	General Electric	570.2	4	4,304.5
6	A. T. & T.	505.3	11	2,263.1
7	Ford	472.3	13	2,082.6
8	Lockheed	412.7	8	3,307.9
9	Curtiss-Wright	354.7	9	2,294.5
10	Douglas	291.1	5	3,991.5
11	Martin	271.4	17	1,191.2
12	Hughes	205.9	40	444.7
13	Bendix	194.1	16	1,341.8
14	General Motors	182.1	1	6,821.1
15	McDonnell	172.9	22	865.5
17	Chance Vought	143.8	—	—
18	Republic	139.2	10	2,270.5
21	Sperry-Rand	127.7	15	1,405.7
22	RCA	125.7	21	878.3
23	Goodyear	106.5	27	646.0
27	Avco	84.5	29	608.8
29	General Tire (Aerojet)	70.0	52	316.4
33	Gen. Precision Equipment	62.1	57	283.1
34	Raytheon	59.7	41	433.9
35	Collins Radio Co.	57.8	45	399.4
36	Fairchild	56.4	28	644.5
40	Firestone	49.5	38	478.5
43	Continental Motors	46.6	49	330.6
44	Hazeltine Corp.	46.2	62	237.3
47	Lear, Inc.	43.5	—	—
49	United Ind. Corp. (Hayes)	40.5	89	155.1
50	Sundstrand	39.4	—	—
54	Piasecki (now Vertol)	35.2	51	328.9
60	Gilfillan Bros., Inc.	33.1	74	186.2
62	Minneapolis-Honeywell	32.6	66	222.1
63	American Bosch Arma	32.0	67	216.7
66	Northrop	31.4	19	985.4
68	ACF Industries, Inc.	31.3	48	336.6
74	Garrett Corp.	27.7	93	142.9
75	Amer. Machine & Foundry	27.4	75	183.8
82	Grumman	24.5	14	1,445.2
93	Bell Aircraft	17.9	36	502.9

Radar Beacon Program Moves into High Gear

By LOIS C. PHILMUS

The long-sought radar beacon is scheduled for top priority attention by government agencies this year. Heading the airlines' list of "musts" for several years now, the beacon will get intensive attention from the Air Navigation Development Board both in terms of funding and program emphasis.

The evaluation project—a joint ANDB-CAA project—has a budget of more than $1 million for the fiscal 1957 period. It will be launched in a rare spirit of optimism, cooperation and compromise.

Because of known traffic limitations of the present beacon system, an operational doctrine must be formulated. Both the military and civil agencies and users are aware that without such a doctrine joint use of the system cannot be satisfactorily accomplished. So, with the spirit of "compromise or nothing" prevailing, chances of agreement are virtually certain.

• **The first decisive move** was taken by ANDB's Advisory Committee No. 2, when it decided last month to break through the military-civil uncertainties on use. The committee resolved that "all users of transponders have indicated the moral obligation to do everything possible to prevent interference by different functions of the system."

Under the committee's sponsorship, a series of interagency conferences were scheduled to start last week to develop a compromise operational plan.

The plan will incorporate agreement on the number of transponders that can be used; what beacon stations will be used for what purposes; and who will use transponders under what conditions. The urgent need for beacons in air traffic control is expected to hasten agreement between the agencies, even possibly eliminating need for Air Coordinating Committee coordination.

• **Traffic limitations** of the system have been described by Walter Pike, ANDB engineer in charge of the beacon program, as "operational restrictions to overcome technical limitations." The beacon, he declared, just does not have the capacity for everyone who wishes to use a transponder to do so.

While the operational doctrine is in discussion stage, ANDB and CAA are proceeding rapidly to inaugurate the timetable for the two-phase evaluation. The service environment test is scheduled to begin around mid-January. CAA, with military participation, will conduct this phase to determine aspects of handling, including transponder overloading and extent of "fruit"; system coverage, code garbling and reflections.

• **Nine stations** are being established in the New York, Washington, Norfolk and Chicago control areas. ANDB is furnishing the ground equipment that will be installed by CAA in the areas' enroute and terminal facilities.

The operational phase is tentatively scheduled to begin around June or July. Definite starting dates are dependent on two factors:

• Development of "defruiters." Although behind schedule, efforts to accelerate development are encouraging. CAA's Technical Development Center has been working with two types developed by the Naval Research Laboratory. Two contracts are being awarded for further development and possible prototype production. Reportedly, Airborne Instruments Laboratory will receive one of the contracts.

A substantial portion of ANDB's present budget is directed toward breaking bottlenecks blocking solution of antenna siting problems.

Other technical developments are proceeding to everyone's satisfaction. For instance, showing great promise is the work for providing simultaneous display of beacon and radar signals at different scan rates through the use of the timesharing system.

Probably farthest along is the development of airborne equipment. Wilcox Electric is expected to start deliveries in the Fall and Stewart Warner is close behind. By spring, the airlines are virtually certain that Collins, Bendix and RCA will definitely be in

Lockheed WV-2 Gets 'Flying Saucer' Antenna

Lockheed Aircraft has fitted a new pancake-shaped early-warning radar installation on a Navy WV-2 Super Constellation. Aircraft is now being flown at Edwards AFB, Calif., to test aerodynamic characteristics of discoid radome, which is 30 ft. in diameter. Radome contains new type antenna developed in studies of airborne radar detection. If successful, new WV-2 may be follow-on production item to picket planes now in service.

production readiness, if not before.

• **The airlines** are happily gearing for action, despite Pike's earlier prediction that airline participation in the early days of the evaluation will be "on a calculated risk basis." The airlines answer appears to be that "progress has to be made."

About 10 airlines are expected to equip for the evaluation, with a substantial number equipping a significant portion of their fleets in terms of type of airplanes. Some of the carriers will install transponders on as many as 20 to 30 of the aircraft types. Eastern is expected to be the first to equip its fleet for action. Wilcox alone is believed to have received orders for about 250 transponders.

The prevailing attitude on the eve of the evaluation is a far cry from the chaos existing around the short-range navigation hassle. The diversified interests are more than willing to work together to study the beacon for common-system use, or gain enough knowledge to perfect the existing system, or have a basis for creating a new one.

Pike found that all involved are "getting a better grasp of the problems." He strongly feels that "despite the limitations to the system, the beacon still has much utility for air traffic control purposes." With his attitude strongly supported by all parties involved, progress seems assured. ◈◈◈

France Buys 70 More U.S. Helicopters

Orders for 50 more Vertol H-21 helicopters and 20 Bell 47G-2s have been placed by the French government, bringing total French purchases of U.S.-designed rotorcraft in the last 12 months to 280.

An initial order for 50 H-21s was placed last March by the French Defense Ministry under a $20-million contract. Vertol so far has delivered 21, which have been in service during the Algerian crisis. Bell's $1.2 million French contract was its largest commercial order of the year.

Rocket Firing Contests To Be Held Oct. 13-18

This year's USAF Rocket Firing championship, to be held at Yuma, Ariz. Oct. 13-18, will be between North American's F-86D and Northrop's F-89D. Lockheed F-94Cs won the meet the last two years, but lost out in the qualifying trials this year. Five F-86D teams and four F-89D teams qualified for the 1956 event by winning championships within the various commands.

Wood Named AAP Editorial Director

Robert H. Wood, assistant to the president for public relations of McDonnell Aircraft Corp., will become editorial director of American Aviation Publications Oct. 1, Wayne W. Parrish, editor and publisher, has announced.

Wood was editor of *Aviation Week* magazine from the time it was created from merged publications of McGraw-Hill Publishing Co., until early last year. Prior to that, he was founding editor of *Aviation News*, a predecessor to *Aviation Week*.

Wood

He began his editorial career with AMERICAN AVIATION magazine in 1938, six months after it was founded, and became the first managing editor of *American Aviation Daily* in 1939. He held the latter position until 1943, when he resigned to join McGraw-Hill.

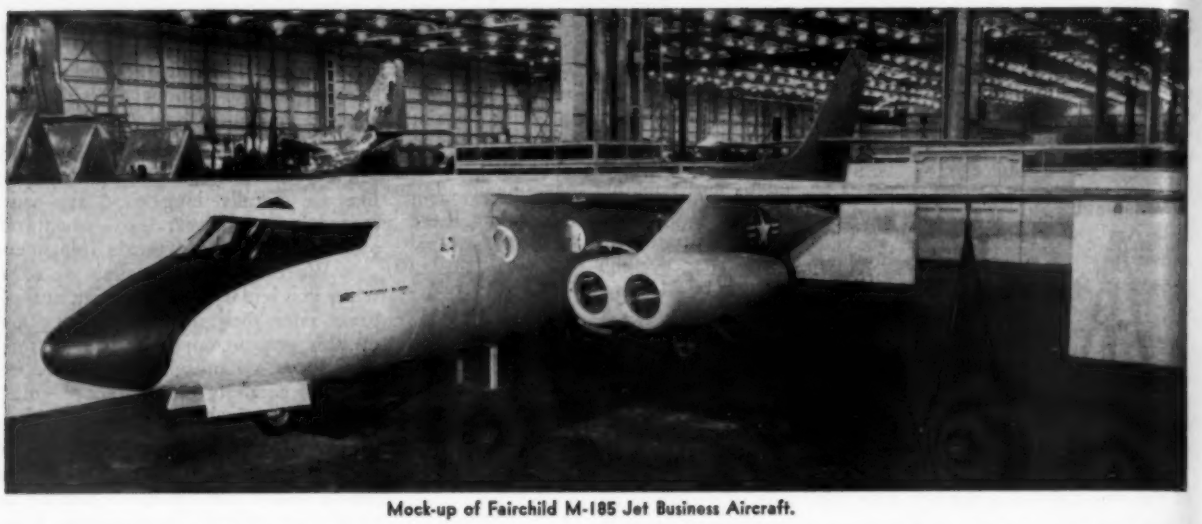
In his new position, Wood will supervise all editorial and news functions of all publications of AAP.

In an exchange of letters pertaining to the appointment, Editor and Publisher Parrish commented: "It seems like an awfully long time ago—and indeed it was 18 years ago—when you joined AMERICAN AVIATION Magazine . . . We're much bigger than we were when you left us in 1943. From annual gross sales then of $200,000, we are up this year to approximately $3 million. From a handful of employes, we are now a family of 150. We're going much farther in the next few years."

Wood commented, "It is with a sense of both nostalgia and challenge that I return with genuine pleasure to AAP." He added, "I've admired from the outset the independent and constructive approach you and AAP have always taken toward the aviation industry and its problems . . . AAP is held in the highest regard throughout the aviation industry, as a useful, constructive and powerful force."

Vulcan: New 'Gat' for Supersonic Fighters

New 20-millimeter automatic cannon, developed for the Air Force by General Electric's Aeronautic and Ordnance Dept., undergoes tests at Army's Aberdeen (Md.) Proving Grounds. Called the Vulcan, it contains 448 parts and can fire more shells in one minute than a 400-man infantry rifle company can shoot in 20 seconds. Main USAF use will be in high-speed defense against fighter aircraft.



Mock-up of Fairchild M-185 Jet Business Aircraft.

M-185 Order Aids Fairchild's Jet Sales Push

Fairchild's drive for a major role in the executive jet transport field got into high gear last month with announcement of first orders for the company's 10-place, four-jet M-185 transport.

The buyer: Continental Can Corp., which only a few days earlier had ordered an executive version of the Hagerstown company's twin-turboprop F-27 transport. Continental signed a letter of intent calling for three of the new M-185 executive aircraft for delivery about 1960.

The M-185 has a high-wing configuration featuring a sweep-back of 25 degrees. It has a span of 57.3 feet and a length of 56.2 feet. It will be powered by four turbojet engines of 2,000 pounds thrust each, slung in pairs from wing pylons. Most likely powerplant is Fairchild's J83, now in development for the USAF, but other small turbojets like the General Electric J85 or the Westinghouse/Rolls Royce J81 might also do the job. Its price, according to a Fairchild spokesman, will be "slightly less than $1 million."

The aircraft will have a crew of two and a passenger capacity of eight, a cruising speed of 550 miles and a range in excess of 1,500 miles. It will have a cabin pressurization equivalent to 8,000 feet at an altitude of 45,000 feet and a gross weight of about 28,000 pounds.

Fairchild's Aircraft Division has completed a full-scale mockup of the machine at Hagerstown, where it will be produced. A prototype model is expected to be available for flight tests late in 1957 or early in 1958. Actual deliveries are not expected until about 1960 because of the extensive testing required by jet aircraft and because of uncertainty regarding the availability of engines.

• **Gen. Lucius Clay, USA (Ret.),** chairman of Continental Can, was enthusiastic about the possibilities offered by executive jet transports, and the M-185 in particular. Declared Clay: "The Fairchild M-185 will enable us to keep abreast of competition in air transportation, and that, in turn, will help us to keep pace with the rising tempo of competition in business and industry."

High-salaried corporate executives have a productive worth to their companies far greater than their salaries, ranging up to thousands of dollars an hour, Clay said. The M-185 will be twice as fast as Continental Can's current aircraft, permitting its executives to cover many more miles a year, he noted.

"Another important consideration is the cost factor, and we estimate that the operating cost of the M-185 will be about the same as for one of our twin-engine Lodestars," he added. "The big dividend, then, will be the M-185's speed. The speed, plus pressurized comfort and the airplane's availability whenever we want to use it, will give us a new dimension in our transportation system and greatly improve our company's communications."

• **As evidence** of the M-185's speed, sample flight times were given for the following routes: New York-Chicago, 1 hour 30 minutes; New York-Miami, 2 hours 20 minutes; Chicago-Dallas, 1 hour 40 minutes; Dallas-Los Angeles, 2 hours 40 minutes, and Los Angeles-Kansas City, 2 hours 50 minutes.

"In ordering the F-27 and its three M-185s, Continental Can acquires a fleet of the world's fastest business machines and leaps 15 years ahead in speed," Fairchild president Richard Boutelle said. "With the F-27 and the M-185—the greatest executive aircraft team ever fashioned—Continental Can and other corporations can step up their increasingly vital management and sales

Model of Fairchild M-185

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transport to the speeds of the 1960s."

"The M-185 has been under intensive development for several years, conceived both for urgent military requirements and for industrial fleets," Boutelle continued.

"Fairchild's experience in the medium transport field led us to the conclusion several years ago that a very important unit was mising from the development picture—the airplane now coming out as the M-185."

He pointed out the possibilities of the M-185 to the military services, listing the following potential uses: administrative transport, combat readiness trainer, high priority cargo transport, navigational trainer, tow-target aircraft, photographic aircraft, electronics test aircraft, electronics counter measures trainer and engine test bed.

In this connection, it is interesting to note that the M-185 comes quite close to the specifications and performance requirements listed last month by the Air Materiel Command in its competition for a four-jet utility transport. (AMERICAN AVIATION Magazine, Aug. 27, p. 14).

Pricewise, the Fairchild offering is far more costly than the $400,000 target suggested by AMC for the 10-place jet transport, but mass production economies on more austere military models may bring the price down to a level more palatable to AMC. ◆ ◆ ◆

Ignition Reliability Hits a New High

By JOSEPH S. MURPHY

SIDNEY, N. Y.—Aircraft engine ignition problems, historically a first-place headache for airline engineers and maintenance officials, may be headed for the role of an also-ran.

Premature removal rate for key ignition components has dropped sharply during the past 12 months. And the number of major "fixes" being sought by the carriers correspondingly have diminished to an insignificant level.

This was apparent here when Scintilla Division, Bendix Aviation Corp., held its 1956 Aircraft Engine Ignition Conference. Nearly 100 specialists in attendance—representing U.S. and foreign airlines, Air Force, Navy, Civil Aeronautics Administration and engine manufacturers—bridged a 194-item agenda without producing a major ignition system problem in need of immediate correction.

• **Scintilla's chief service engineer** H. C. Welch cited statistics to bear out the improved airline record in operating the most "sensitive" of ignition components, carbon brush distributors. In Pratt & Whitney R2800 engine operation, virtually every carrier reported a 50% or better drop in unscheduled removals compared to 1955 performance.

Eight airlines showed a removal rate of less than 0.5 per thousand engine hours flown—equal to one distributor for every 2,000 engine hours.

And although the record for Wright R3350 DA engines showed a higher removal rate, Welch attributed this to possibly unwarranted changes by carriers due to timing of Turbo Compound distributors. To trace this problem to its source, Scintilla now has nine special distributors being operated by four major airlines. Plan is to return each unit to Scintilla upon removal for an accurate check of change in timing against time in service.

As to the overall airline operating record, carriers urged that Scintilla come up with a standard form for reporting ignition discrepancies so that it would more closely reflect only "justified" unit removals. Detailed discussion at the session disclosed, however, that varying airline practices as to handling of premature removals almost preclude adoption of any reporting standard.

Although most airlines conduct a check of unscheduled removal items before overhaul, American Airlines makes no shop check or record unless the unit time is estimated at less than 300 hours. Stand taken by American's C. C. Mitchell was that the added expense of such checks and records would outweigh any benefit to be gained.

• **Other airlines** took strong exception to this viewpoint. Northeast Airlines' V. Dodd said the 10-minute check of all premature removals pays big dividends in reduced costs by limiting the amount of overhaul that may be needed. Scintilla officials expressed the stand that failure to establish such removals as either justified or unjustified is unfair both to the manufacturer and to shop personnel overhauling the equipment.

The improvement in ignition system performance in general couldn't have come at a more opportune time. The reason—experimental test time available at engine manufacturers is in short supply—seriously limiting the amount of improvements that can be tested and stretching out the test period for those considered urgent enough to merit testing.

Pratt & Whitney's A. F. Yacavone told the session that available engine test time is diminishing and urged more thorough screening of proposed changes requiring engine test. Although P&W has not revised its staunch attitude that all changes must get its prior evaluation, hint came from Yacavone that some leniency may be on the horizon, but this would depend on the specific item to be tested. Yacavone figures available test time now represents about 25% of that available at the height of R2800 engine development.

Airline Ignition Performance

Here's how major U.S. and foreign airlines fared during the past year in ignition system performance on seven aircraft types. Tabulation shows average delays and component removal reported by carriers, as well as the highest and lowest recorded by an individual airline.

Aircraft	Rate per 1,000 Engine Hours Average	High	Low
DC-3			
Ignition delays	1.26	3.91	0.10
Magneto Removals	0.29	2.70	0.08
DC-4			
Ignition delays	1.75	4.27	0.25
Magneto removals	0.52	2.00	0.10
DC-6/A/B			
Ignition delays	1.53	6.60	0.14
Magneto removals	0.24	0.96	0.06
Distributor removals	0.56	2.02	0.05
Convair 240/340			
Ignition delays	1.18	3.45	0.20
Magneto removals	0.26	0.60	0.07
Distributor removals	0.70	3.34	0.06
DC-7			
Ignition delays	0.91	2.00	0.35
Magneto removals	0.29	0.97	0.01
Distributor removals	1.67	3.37	0.50
L-049/749			
Ignition delays	1.05	2.00	0.45
Magneto removals	0.13	0.36	0.02
Distributor removals	0.59	1.50	0.06
L-1049			
Ignition delays	0.87	2.43	0.28
Magneto removals	0.17	0.43	0.04
Distributor removals	1.52	4.14	0.28

Conference Notes

• **Pratt & Whitney** will soon test a General Electric blower and heating element installation to combat moisture in R2000 engine magnetos. Assembly carrier P&W drawing number LR-61058-21.

• Eastern Air Lines is now operating Wright R3350 BD series engines at an all-time high overhaul period of 2,025 hours. Previous high of 2,000 hrs. was reached several years ago by Chicago & Southern Airlines before merger with Delta. ◆ ◆ ◆

Lathe Gives 'Hawk' Precision Finish

Hi-nickel alloy steel contoured bulkhead sections and radome molds for Army's Raytheon Hawk surface-to-air missile are machined to +.001 —.000 in. tolerance by Diversey Engineering Co. of Franklin Park, Ill. Company employs Monarch 20-inch manufacturing lathe fitted with template-controlled air-gauge tracer mechanism. Each missile part undergoes 200 separate dimensional checks before acceptance.

Hydro-Aire's New Bearing Design

Hydro-Aire, Inc. has developed a new bearing design to meet the higher performance requirements imposed by aircraft manufacturers for fuel booster pumps.

Function of the booster pump is to feed a solid stream of fuel to the engine-driven pump under all conditions, and eliminate fuel vapors and "bubbles" at altitude. Hydro-Aire's HY-V/L (for high vapor-liquid ratio) pumps accomplish this job without the vapor separator required in conventional units by compressing the vapors back into the fuel stream. This pump, says Hydro-Aire, offers greater efficiency, needs less power, and is more compact. It is now being used by five aircraft manufacturers.

Recently, however, a new challenge for pump designers has been imposed by the aircraft manufacturers seeking greater performance. This centers around the fact that after a booster or transfer pump has "sucked" all the fuel from the tank it will continue to run dry, and since the pump is cooled by the fuel this dry run will generate heat in the pump bearings.

If the pump burns out it may cause an explosion in the fuel tank. Or the pump case's temperature may exceed the danger point, producing the same result.

• **One aircraft manufacturer** submitted a requirement for fuel booster pumps for 18 hours dry run at an altitude of 55,000 feet with the unit's temperature not to exceed 400° F. Conventional designs could meet this requirement at sea level, but not at altitude. Only alternative seemed to be the addition of a thermal cutout, which would add weight and complexity.

Hydro-Aire engineers however, met this 18-hour requirement at no cost in weight by devising a multi-piece bearing in which the pieces are held in place by a sleeve having a greater coefficient of thermal expansion than the shaft.

By this means, heating of the shaft and bearing in a dry run also results in heating of the sleeve. Since the sleeve expands more rapidly than the shaft it allows the multi-piece bearing to be forced apart from the expanding shaft. The result is that seizing of the shaft is avoided and the pump is permitted to run dry.

• **Another aircraft manufacturer** has come up with an even more stringent requirement for a fighter aircraft. This new requirement calls for the pump to run continuously for 1,200 hours in three-hour cycles; two hours of dry run at 50,000 feet and 150° F. ambient and one hour of running submerged in fuel at sea level. This means the unit runs dry at altitude for 800 hours.

Hydro-Aire reports it knows of no other pump that has succeeded in meeting this requirement for more than 50 hours. Its HY-V/L pump is now undergoing this endurance test and is nearing the 700-hour mark. Hydro-Aire engineers are optimistic about its chances of going on for the additional 500 hours to accomplish the required 1200-hour test criterion.

The following are other recent improvements in Hydro-Aire's submerged A. C. Motor-driven fuel booster pump design: (1) a simplified thrust washer arrangement eliminating certain parts and machining operations; (2) elimination of most of the rubber O-rings formerly included in the unit; (3) a new fusite terminal assembly, potted in an epoxy resin to protect this component from moisture; (4) a larger screen inlet which has improved pump performance; (5) further lightening of the pump by changes in the body casting. ◈◈◈

Circle No. 17 on Reader Service Card.

Fastest U. S. AIR FORCE TRANSPORT IN PRODUCTION

Allison Turbo-Prop powered Lockheed C-130 Hercules can outfly present passenger airliners while airlifting up to 20 tons of cargo

POWERED BY FOUR 3,750-horsepower Allison T56 Turbo-Prop engines, driving three-bladed Aeroproducts turbo-propellers, the Lockheed C-130 Hercules attains top speeds of over 370 miles per hour. And it operates at less than half the ton-mile cost of its nearest competitor.

More than 100 miles an hour faster than tactical transports flying today, the C-130 on combat missions, with 25,800 pounds of cargo and more than 5,000 gallons of fuel, can cross the continent, or an ocean, nonstop at 330 miles per hour cruise speed.

Thus, the U. S. can put supply lines in the sky – with ability to airlift cargo, personnel and equipment from the continental U. S. to a distant overseas air base and reach a combat area shortly following the arrival of jet aircraft.

With full load, the C-130 takes off and climbs to 2,500 feet in 60 seconds – a remarkable feat for a large transport. The Hercules has a flexible flight envelope in that it has the ability to fly at low altitudes for airdrops of personnel and equipment and yet has a high-altitude range of 40,000 feet.

Product of a 5-year joint effort by the Air Force, Allison and Lockheed Aircraft, the C-130 is being produced in quantity by Lockheed's Marietta, Ga., plant. These high-performance Turbo-Prop transports will begin joining the Tactical Air Command late this year.

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis, Indiana

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more reliability ½ the size

THE GLIDESLOPE AND MARKER RECEIVERS OF COLLINS NEW ELECTRONIC SYSTEM

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51V-3 Glideslope Receiver
Compact and weighing slightly over 6 pounds, the 51V-3 permits selection of any of the 20 glideslope channels. Modularized, available with AC/DC or DC power supplies; spurious response 60 db or more down. Specifications are higher than those in ARINC Characteristic 519 and it is contained in a short ¼ ATR case.

51Z-2 Marker Receiver
With a maximum weight of 4.5 pounds and a case size of ¼ Short ATR, the 51Z-2 is the lightest, smallest Marker Receiver available. Power is reduced to a new low—an average of 15 watts; operation is reliable and sure. AC or DC power supplies available. Fully meets all airline standards.

Call your nearest Collins Sales office or write for the new brochures on Collins Glideslope and Marker Receivers; also available is a brochure describing Collins New Airborne Electronic System.

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Circle No. 15 on Reader Service Card.

How SELCAL is Working for Pan American

Selective-signalling system of communications, in use for two and a half years, reduces pilot fatigue and distraction, aids safety.

By HENRY P. STEIER

Among airline problems, the need for an improved and assured means of communication between an airline and its aircraft, or between controllers and pilots, has long been an increasingly pressing one.

Over land routes the problem has received newly focused attention on deficiencies in the air traffic control system. However, one airline faced long ago with the tracking problem over long water routes decided to do something about its problem.

Pan-American World Airways, Inc. on New Year's Eve 1953 put into operation the world's first selective signalling-equipped air route approved for operation. Today throughout the vast area covered by its Pacific Alaska Division, the system developed by Pan American, and which came to be known as SELCAL is in operation. Originally it was known as SELSIG.

• **Backbone of the solution** to the need for instantaneous and automatic derivation and reproduction of information required on specific aircraft is the Air Traffic Control Signalling System (ATCSS) and Private Line communication concept that has received renewed attention recently (AMERICAN AVIATION, July 30.)

SELCAL now has been in operation more than two and a half years. Functional requirements were developed in April, 1952. Long flight legs flown by Pan American, some more than 2,000 miles long, presented severe problems of pilot distraction and fatigue resulting from communication duties.

Airline's Aims

Pan American wanted to reduce pilot fatigue and distraction produced by long periods of aural monitoring of often noisy radio signals. It also wanted to be assured of rapid and positive establishment of contact for safety and operational purposes, and to allow more efficient communication circuit performance.

During the 21 months from conception and approval by Aeronautical Radio Inc. and Civil Aeronautics Administration of the SELCAL idea, Pan American's radio engineering group designed, built and flight-tested SELCAL prototypes. First aircraft to use them in tests were DC-4 shuttle aircraft operating between Auckland, New Zealand and Nandi, Fiji Islands, an 1,100 mile route. Pan American's R&D program was carried out under W. W. Lynch, asst. vice president, communications.

• **A contraction** of "selective calling," SELCAL is a system of calling specific aircraft. This is achieved by the ground station. Audio tones are used to modulate a radio transmission for a few seconds. Using different combinations of tones for each aircraft, only a SELCAL unit set up in a specific aircraft for a specific tone combination will respond to the signal. As with a private line telephone a bell rings in the plane or a light flashes, and the pilot then turns on his telephone equipment and establishes contact.

Following initial success with the equipment, Pan American installed it throughout 1953 in the West Coast-Honolulu, Western Pacific-Far East and South Pacific regions. In 1955, after a year's operation in those areas, SELCAL was extended to all Pan American's Pacific routes and Far East routes over which the line's Boeing Stratocruisers operate. Last April, CAA recommended the use of SELCAL on a worldwide basis. In June, the International Federation of Airline Pilots' Associations urged all international aircraft to be SELCAL-equipped to reduce pilot fatigue and distraction to a minimum.

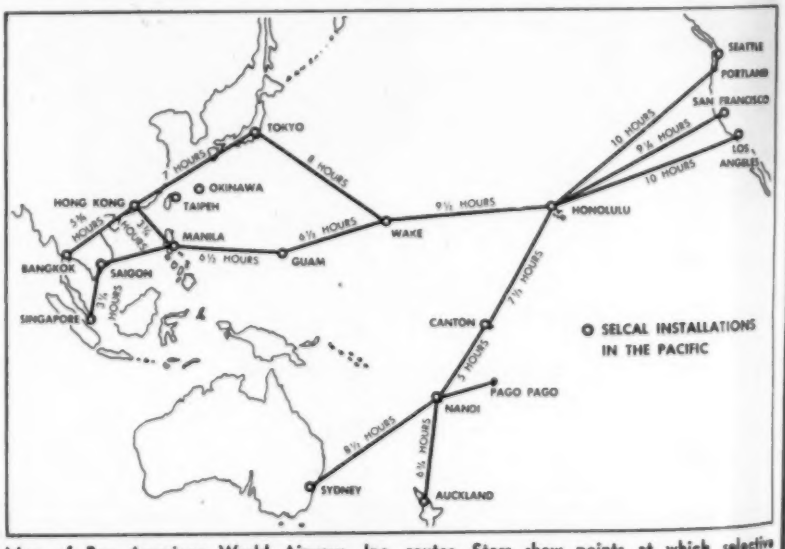
Up to June 1956, Pan American had logged 75,000 flight hours of incident-free SELCAL operation. The airline says original pilot factors, speed and circuit efficiency objectives have been met.

After the CAA and Arinc's Airline Electronic Engineering Committee put their stamps of approval on SELCAL, the design specifications were passed to Motorola Communications and Electronics, Inc. whose "Quik-Call" system formed the nucleus of the tone-calling system. Motorola now manufactures production units of SELCAL.

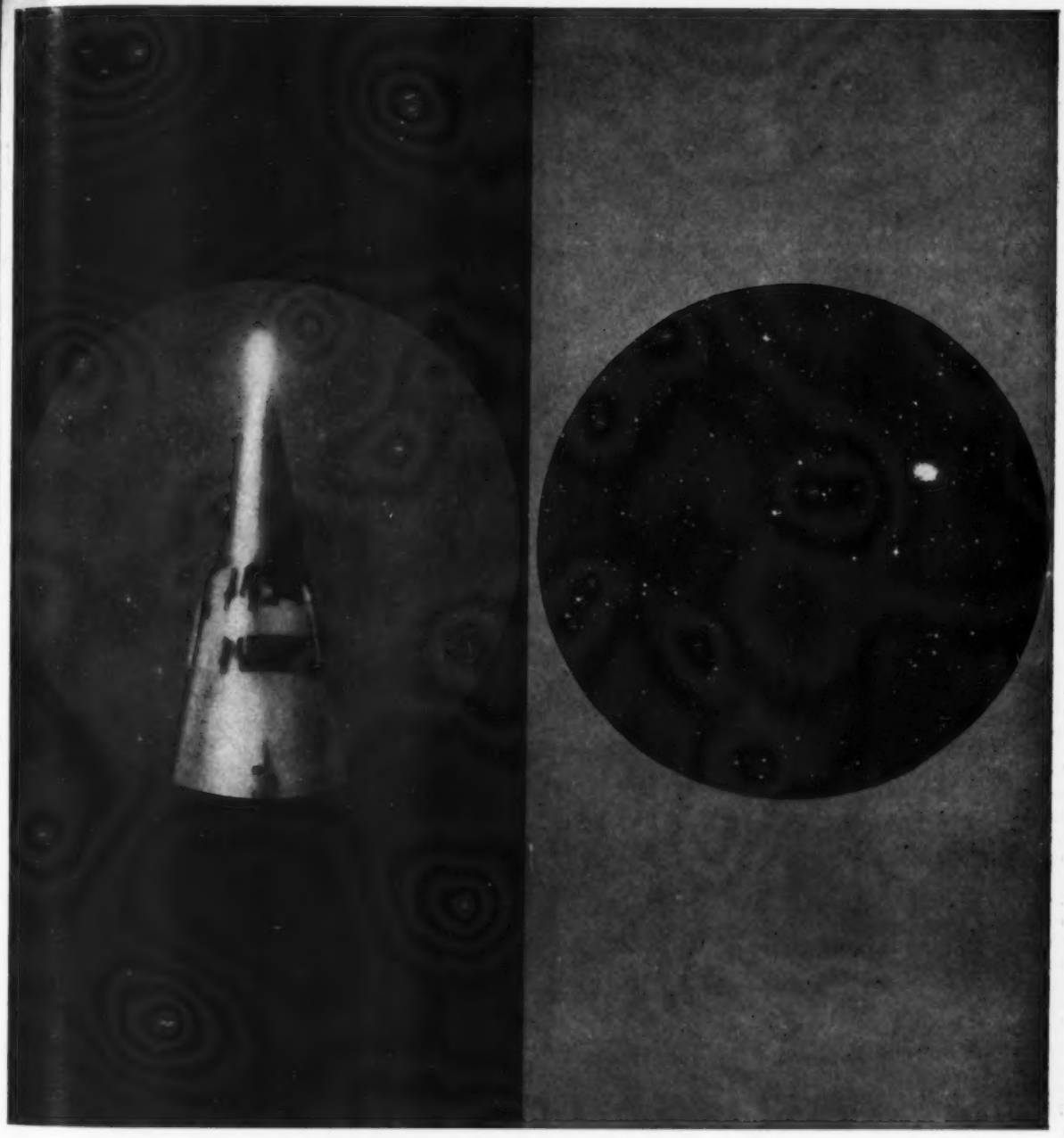
Three Steps Planned

With SELCAL under its belt, Pan American is taking steps beyond the current system. The company has set step-by-step objectives for extension of the SELCAL system to greater usefulness. Three major steps are planned that will take into account expected operation of jet aircraft and their special needs.

• **Time is** of paramount importance in an over-water emergency. Immediate alerting of air-sea rescue agencies in an emergency could make the difference



Map of Pan American World Airways, Inc. routes. Stars show points at which selective calling ground station equipment is installed or being installed for use in airline's operations. Long flight times for different flight legs point up need for service SELCAL deliveries by relieving pilots from continuous monitoring of communication channels during times shown.



HOT TIP

One day not many months from now a Martin rocket—carrying the first man-made earth satellite—will depart this world at an unheard-of speed of 18,000 miles per hour...destination, outer space.

This coming moment in history points up a significant fact:

No other company in the aircraft world knows more today about tomorrow.

MARTIN

between disaster and rescue. Pan American has taken steps toward development of Automatic Alert and Automatic Alert with Aircraft Identification air-to-ground signalling.

This system would permit sending a tone signal *from* the aircraft that would indicate identity of an aircraft in distress to all or a part of ground stations on a given route. This could be done by a push-button and would aid transmission through violent static conditions that would otherwise garble messages. The system could also automatically switch from one high frequency channel to another and then repeat for maximum alerting.

Steps have also been taken toward development of Automatic Existence Checking. At present Pan American is operating SELCAL in the Pacific area on a fixed-time basis. An existence check on each aircraft is made by calling through SELCAL each half-hour. This involves radio operator time on the ground. It could be done automatically with the new system. After this it would become an automatic ground-air-ground system. Aircraft would answer automatically and thus further relieve the pilot of routine answering. In jet operations existence-check repeating times will be increased to 15 minutes.

It concluded that remoting might be accomplished by manual or broad bandwidth techniques, and that narrow bandwidth techniques might be devised but these may need channels wider than voice channels.

Paper 196-55/DO-68 on beacon information remoting said it is important to remember that primary radar and beacon remoting systems usually are not completely independent, especially from an economic point of view. The manual system it said does not appear attractive because of costs involved. Broadband systems might require near five megacycles but permits relatively easy growth of control center equipment and flexibility of use.

Wideband systems would probably require microwave relay links or coaxial cable installations for remoting. Initial cost is high, but expansion of use capabilities would be attractive.

• **Pan American believes** the next step after these steps have been achieved will be automatic flight reporting and control. This is also the aim of Arinc's Airline Electronic Engineering Committee which has already held its first meeting with its subcommittee on ATCSS to examine operational policy for such a system.

The type of data transmission to which Pan American is looking forward for automatic flight reporting and control is also expected to be done by an airline ATCSS. Pan American is hoping for compatibility between their concept and that of the AEEC. Despite this, however, it is believed the airline will continue its own developments while keeping an eye on achievements and characteristics developed by ARINC. ◈◈◈

RTCA Committee 69 Studies Remoting

The Radio Technical Commission for Aeronautics' Special Committee 69, which has been analyzing techniques for providing video data from long radars to Air Traffic Control Centers, has directed its attention to some of the problems in connection with remoting of ATC radar beacon information.

In a supplementary report following its Paper 196-55/DO-68, published last year, the committee has indicated that the beacon information remoting art "is in a very preliminary stage."

Electronotes

• **General Electric Co.'s** self-contained airborne electronic navigator which the Air Force is buying uses Doppler radar for measuring ground speed and drift, a gyro system for direction, and a miniaturized electronic computer to integrate the information for navigation. Unit weighs 150 pounds.

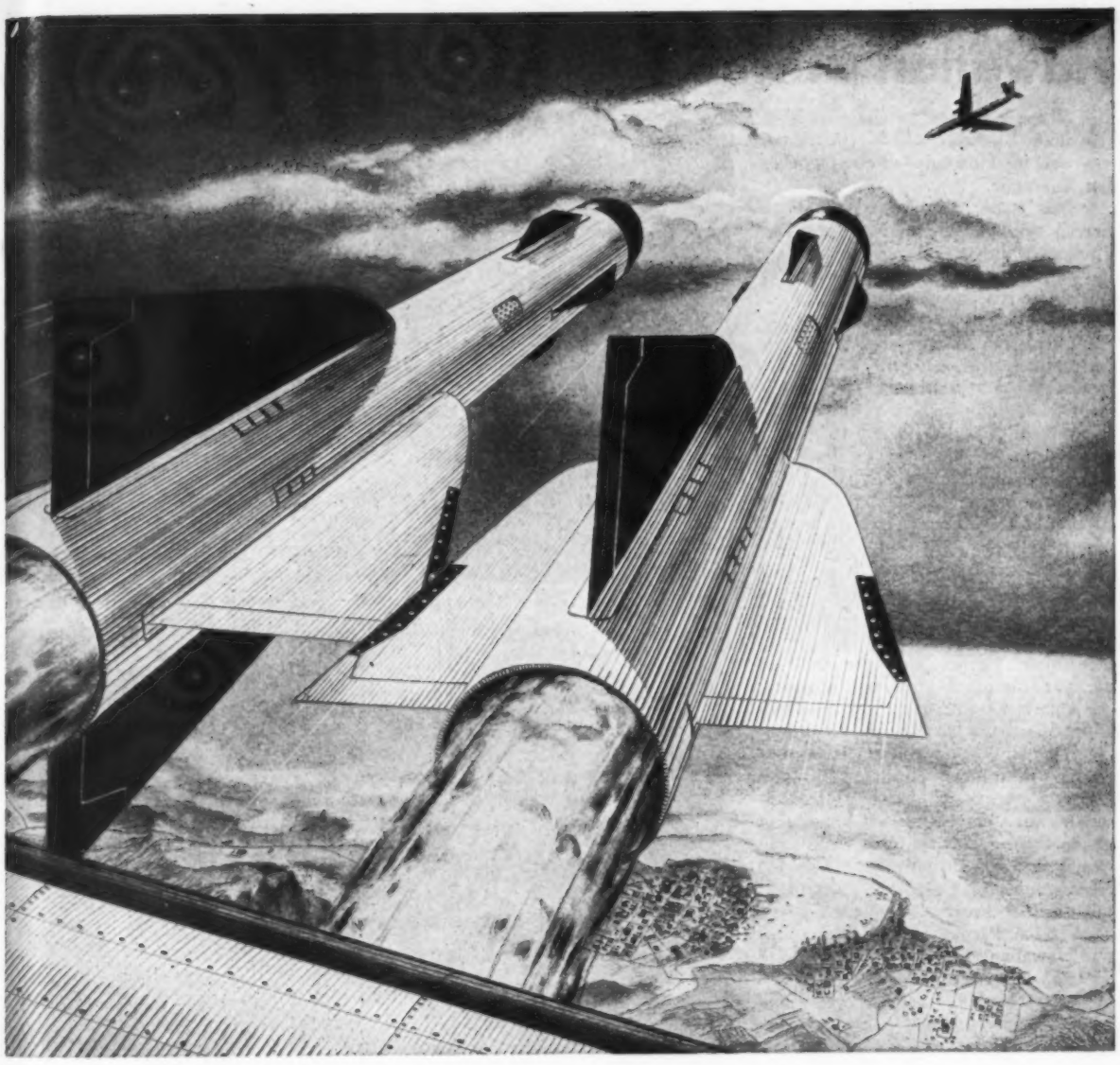
• **Institute of Radio Engineers** Professional Group on Component Parts has grown almost 50 percent in the last year, now has 1,250 members. Dr. Rudolph M. Soria, director of engineering, American Phenolic Corp., is chairman of PGCP's administrative committee. Committee is looking for high quality papers for *Transactions* and the 1957 Electronic Components Symposium.

• **Hard-glass tubes** being produced on a pilot line by Sylvania Electric Co. for the Air Materiel Command, Wright-Patterson AFB, are able to withstand 300-degree Centigrade temperatures. Forerunner of a group rated to operate at that temperature instead of present 200 degree limit, substantial cost savings have been achieved that are expected to save the joint services more than $27 million a year. Services need 100,000 tubes a month.

• **Third annual** East Coast Conference on Aeronautical and Navigational Electronics scheduled for Oct. 29 has been honored by Baltimore's Mayor Thomas D'Alesandro, Jr. who proclaimed the period as "Airborne Electronics Week." Joseph General, Deputy Chief of Development Plans and Programs, USAF Air Research and Development Command, Baltimore, is chairman of the conference.

TV Station for Helicopters

A helicopter TV station developed by Philco Corp.'s Government and Industrial Division for the Navy Department's Bureau of Ships. For use in control of amphibious landings, entire system is an ultra-high frequency FM radio TV link for air-surface or air-ground operations. Tested in 894 mc region, the system uses transmitter of 100 watts effective-radiated-power. Antenna is projected beneath aircraft after takeoff. TV camera scans through door opening.



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Hawaiian Airmotive: Parts-Chasing Experts

When it comes to chasing parts, Hawaiian Airmotive, Ltd.—they'll tell you out in Honolulu—is the world's best, bar none.

This is one reason why the commercial overhaul and maintenance base Vic Pastushin started only two years ago now has nearly 200 workers and is the largest base of its type in the mid-Pacific.

Hawaiian Airmotive became a Pastushin enterprise partly because Vic Pastushin has a sentimental attachment for Honolulu—his birthplace—and partly because he has an eye to the air travel future.

"Honolulu International Airport already is one of the great crossroads airports of the world, but what we see now is only the beginning," said Pastushin. "We want to be in on the growth."

• **One of Pastushin's objectives** is to establish a joint service operation for airlines operating at Honolulu. Now each carrier has his own. "We could do the work more efficiently and cheaper, particularly for carriers having only two or three trips a week," said Pastushin.

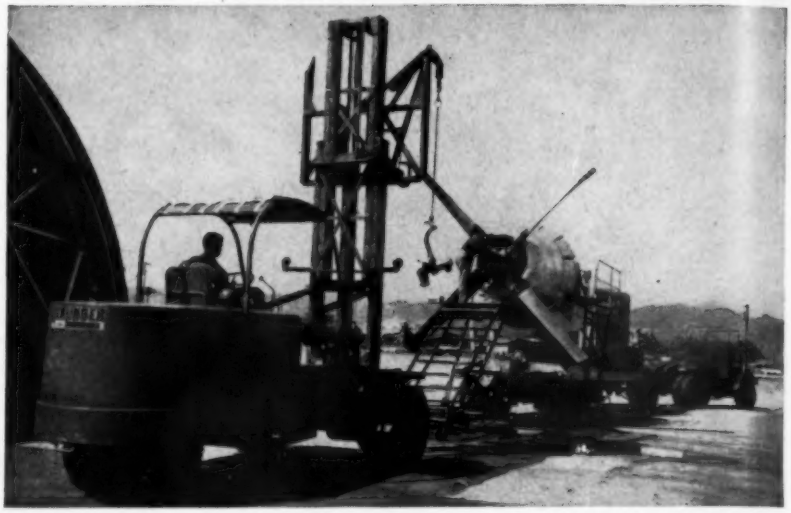
Meanwhile, Hawaiian Airmotive engages in military contracts and performs a variety of tasks as trouble-shooter in the islands. Examples: a major structural repair for a CAA C-54 damaged in a windstorm; an IRAN job for a couple of Civil Air Patrol L-5s for the Air Force; heavy sheet metal work on a Pan American transport.

Hawaiian Airmotive overhauls and repairs component parts for MATS C-97s and C-124s in the Pacific, and recently ran a production line on overhaul and buildup of C-97 power packages for the Air Force. This schedule called for delivery of the first unit within 30 working days and one unit per day thereafter. Hawaiian Airmotive had to set up the production line, build several jigs and fixtures and do all the necessary planning and order bits and pieces in the 30-day period.

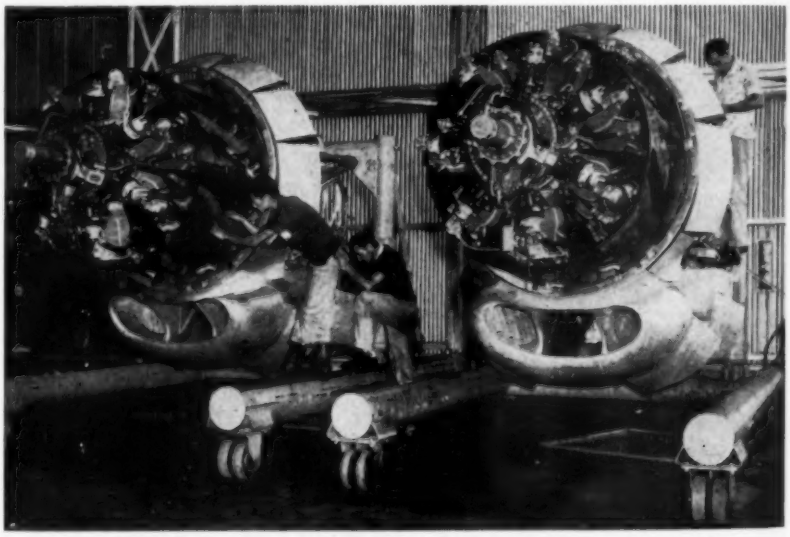
"I'm sure none of the local organizations and very few mainland operators would have attempted it under like circumstances," said Sam A. Wilburn, former vice president of Hawaiian Airmotive, recently promoted to vice president-manufacturing of Pastushin Aviation Corp. in Los Angeles.

The company, Wilburn added, made the schedule and never had a failure due to workmanship. This despite the fact the C-97 power package with P&W R4360 engine installed is regarded as one of the most complicated power packages installed on an airplane.

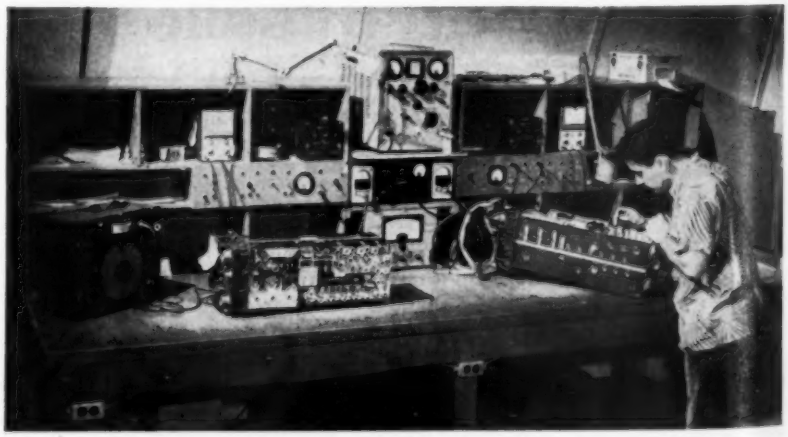
With Wilburn moving up in the



Installing propeller on completed engine assembly prior to final tests at Hawaiian Airmotive.



Installation of engine components in P&W R4360 engines in power package buildup.



Radio equipment undergoing repair.

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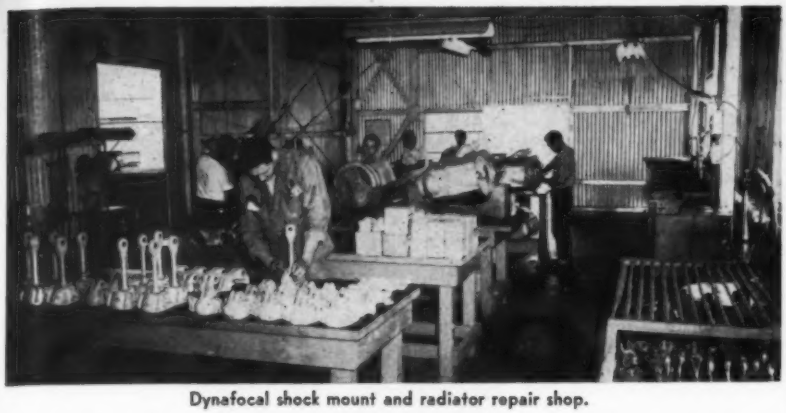

Dynafocal shock mount and radiator repair shop.

Pastushin organization, C. N. McIntosh, formerly in charge of contract administration and production control, became Hawaiian's manager.

• **Pastushin is preparing** his Honolulu facility for the jet age. When new equipment is purchased for current use, every effort is made to obtain equipment that can be utilized on jet aircraft. A hydraulic test bench having a static capacity of 10,000 psi was recently purchased with this in mind. A Miller Heli-arc welding machine was bought for the same purpose.

Hawaiian Airmotive has 47,720 square feet of shop area and 14,380 feet of warehouse area at the Honolulu International Airport. It also has 35,012 square feet of paved area and 44,328 square feet of unpaved area connecting to the main runways and taxiways of the airport. This is under long-term lease from the Hawaii Aeronautics Commission. ◈◈◈

AiResearch Tests New Valve Assembly

A new oil cooler valve assembly developed by the AiResearch Manufacturing division of The Garrett Corp. is being tested on several late model jet engines, including the P&W J57 and the GE J79.

By regulating the flow of oil entering an AiResearch oil-fuel cooler, the new valve controls the temperature of oil lubricating and cooling a jet engine and also controls the temperature of jet fuel used to cool the oil. The valve is unique in that both these functions, regulating oil temperature and fuel temperature, are contained in the same housing to save space in the aircraft. It measures only 12 inches long.

When maximum thrust is not called for, oil flows through an AiResearch cooler and is cooled by the engine's fuel. If the oil temperature becomes too cool, a thermostat-type mechanism forces the flow of oil to bypass the cooler, thus allowing the temperature to rise. When maximum thrust is called for, increasing the temperature of the oil, the controlling mechanism allows more oil to flow through the cooler.

When the oil's rising temperature, at high thrusts, begins to heat the jet fuel to a critical point where an engine malfunction may follow, normal procedure is to ease up on the throttle. With the new AiResearch valve, however, the fuel temperature is prevented from reaching the critical point.

Rivet Gun Helps TWA Cut Wing Repair Costs

Trans World Airlines is cutting wing structural repair costs on its fleet of Martin 4-0-4 transports by use of a Hi-Shear Blind Bolt rivet gun produced by Hi-Shear Rivet Tool Co. of Los Angeles, Calif.

In one particular application, that of installing attach-angles on the upper wing skin of 4-0-4s, TWA figures the Hi-Shear tool saves about $2,500 per airplane.

Big advantage is that it permits attach-angle replacement without removing the outer wing panel. This alone involved a $3,000 expenditure under TWA's former procedure.

The airline now replaces these angles with the Hi-Shear tool at a cost of about $500 per aircraft.

Rohr Paints Power Packages for Lockheed

Lockheed Aircraft Corp. is now having Rohr Aircraft Corp. paint power packages it produces for Super Constellations in airline colors before shipping them to Burbank, Calif. Purpose is to accelerate delivery of airplanes after pre-delivery flight tests.

Previously, Rohr delivered unpainted power packages to Lockheed. This is the way they were installed on airplanes and flight-tested. After tests, they were difficult to paint because they had become oily and dirty.

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Chances are too, that you take this travellers' friend for granted because Air Associates seat belts have been used by most of the world's airlines for almost three decades.

New Nylon-Rayon Belt (M-7500) — features new buckle with disc cut-out for airline insignia. Attractively styled, belt is offered in five standard colors — dark blue, dark green, beige, gray or tan (specials on request). Custom-woven nylon-rayon webbing provides optimum behavior characteristics, long life, and attractiveness. Meets requirements of CAA specification TSO-C22B.

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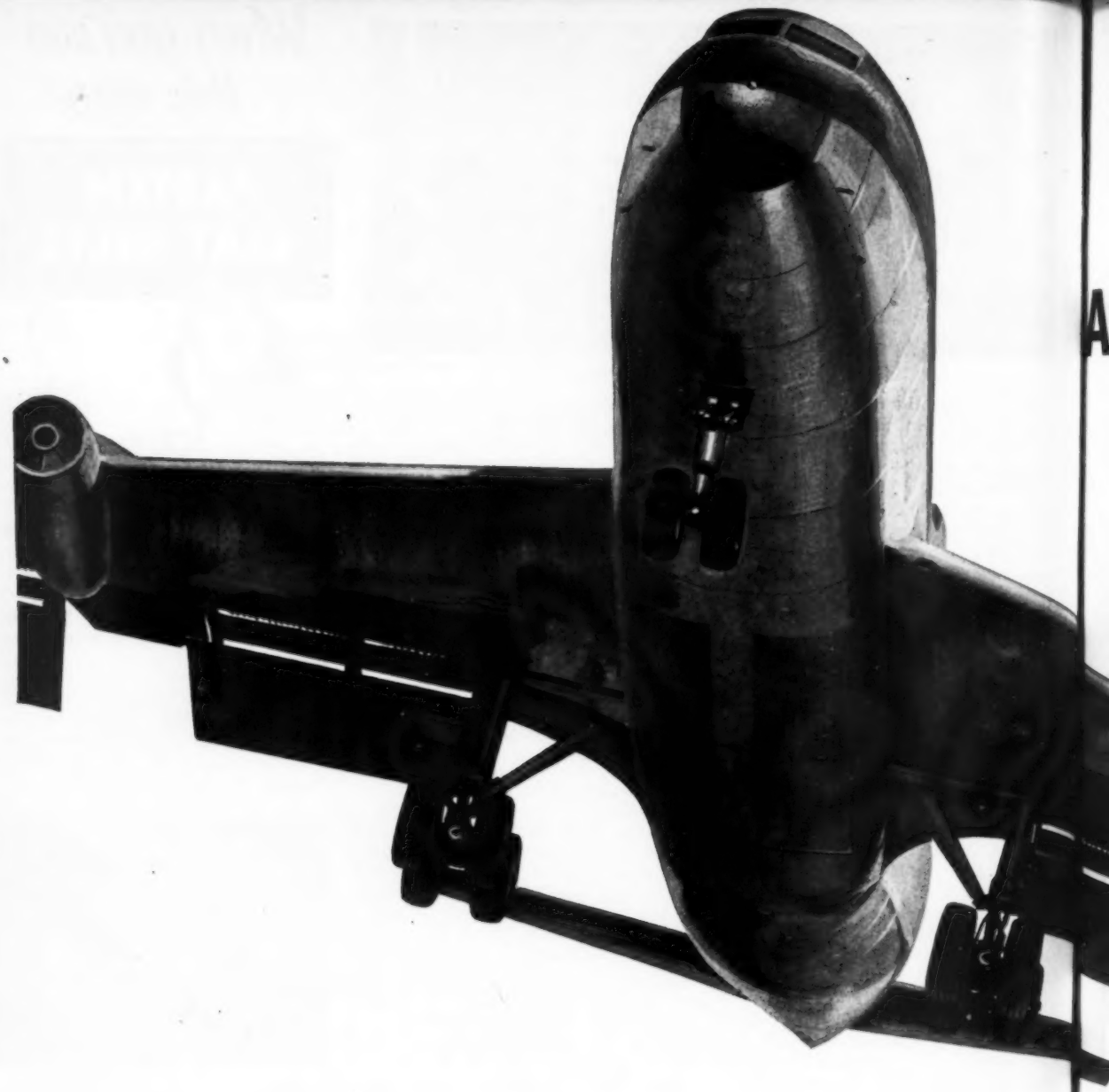

Another addition to the growing list of future

In its new 707 Stratoliner and Intercontinental jet transports, Boeing offers an outstanding example of the high performance and luxury and comfort that will be available to airline passengers in the up-coming jet age.

Bendix is proud to have been chosen by Boeing to supply its PB-20 automatic flight control systems for this "aircraft of tomorrow".*

***Initial deliveries of PB-20-equipped 707s will be to American Airlines and Trans World Airlines. Previous decisions in favor of the PB-20 system were for Lockheed Turboprop Electras, Lockheed 1649A Constellations, Douglas C-133A USAF Turboprop transports, and two of Canada's latest military aircraft.**

The PB-20 is the culmination of a ten-year Bendix development program pinpointed at the design and production of a simplified automatic flight control system that would satisfy completely the vastly more complex needs of the new age of flight.

Application of transistors and magnetic amplifiers in the system has brought about the greater sureness that will be so essential tomorrow. Another important advance in the PB-20 is its continuous self-adjustment over a wide range of airspeeds . . . thus making possible safe, smooth control whether the aircraft is cruising at upwards of ten miles a minute or landing at 100 mph.

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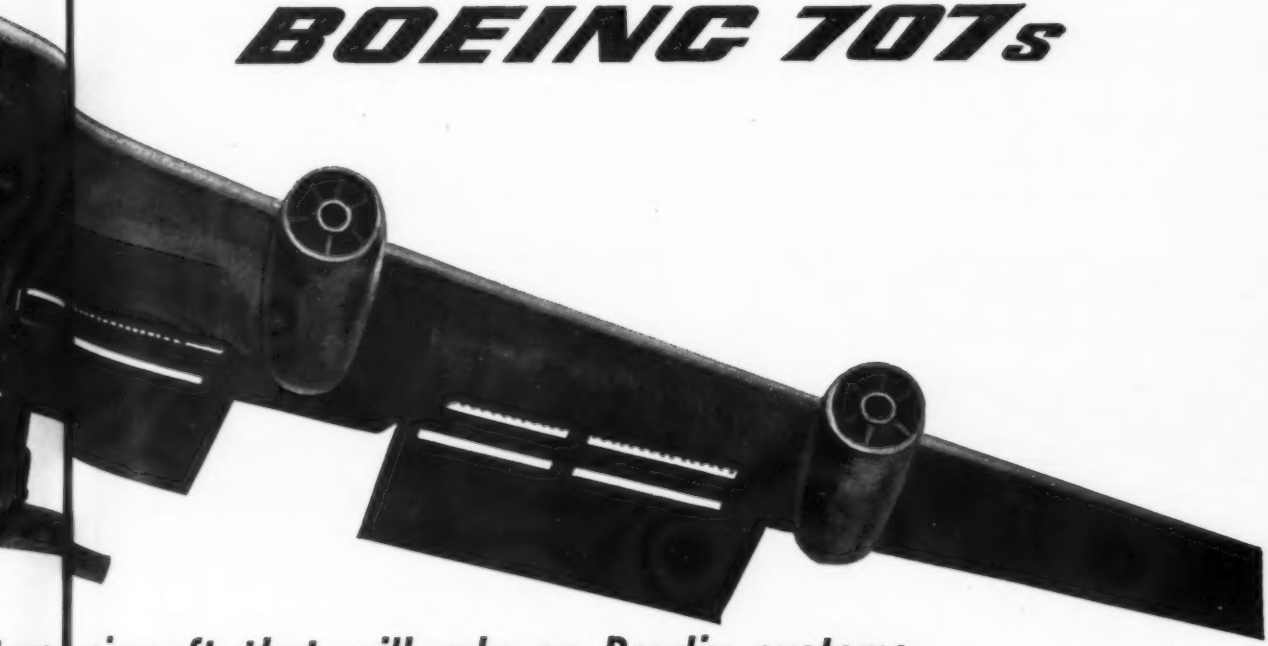

aircraft that will rely on Bendix systems

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PAA and Aeroflot Sign Agreement

An agreement on "commercial cooperation in civil aviation" has been signed by John Shannon, Pan American World Airways' Atlantic Division operations manager, and N. A. Zakharov, deputy head of Russia's Aeroflot.

It provides for the sale of tickets on Aeroflot's routes by PAA and for the sale of tickets on PAA routes by the Russian carrier. Similar interline agreements have been concluded between Aeroflot and several European airlines but this is the first to be signed by an American carrier.

The conclusion of an interline agreement was less than many observers expected to result from the PAA official's Moscow visit. It was thought that firm arrangements might have been made to pave the way for PAA to start through service to the Soviet capital.

There are some indications that the Russians are no longer as keen to have PAA fly to Moscow as they appeared to be a few months ago. At that time both PAA and the Soviet government seemed optimistic that the U.S. carrier would be flying to the Soviet capital by the year's end or earlier.

New Details on Petrel Missile

Navy's Petrel air-to-surface missile, shown on Lockheed P2V launching aircraft, measures about 24 ft. long, has 13-ft. wingspan and weighs about 3,800 lbs. Petrel consists of airframe with guidance, stabilization and propulsion units and carries torpedo-type warhead for launching outside defensive range of enemy surface ships. Manufacturer is Fairchild's Guided Missile Div., Wyandanch, N. Y.

AF Develops Superior New Altimeter

Wright Air Development Center has developed a new altimeter in conjunction with the Kollsman Instrument Corp. said to be 400% more accurate at altitudes below 50,000 ft. than any other altimeter in use.

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Called the MA-1, it reduces maximum error at 10,000 ft. from 350 to 80 ft.; at 30,000 ft. from 900 ft. to 180 ft.; at 50,000 ft. from 1,500 ft. to 280 ft., and at 80,000 ft. from 3,000 ft. to 1,500 ft. It maintains this accuracy at from —35° to 70°C.

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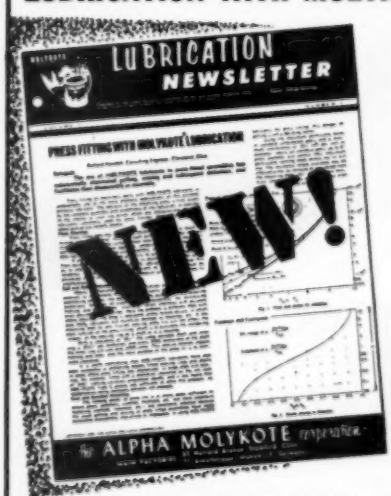

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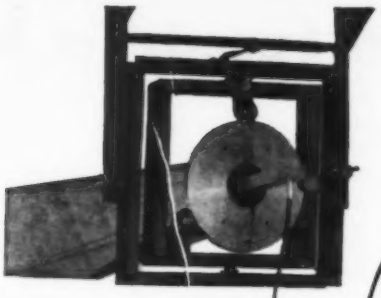

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How Air-Log System Speeds Jet Maintenance

A universal type dolly, particularly adaptable for jet engine handling, is the key unit in a streamlined ground support system developed by Air Logistics Corp. to simplify jet aircraft maintenance and cut costs.

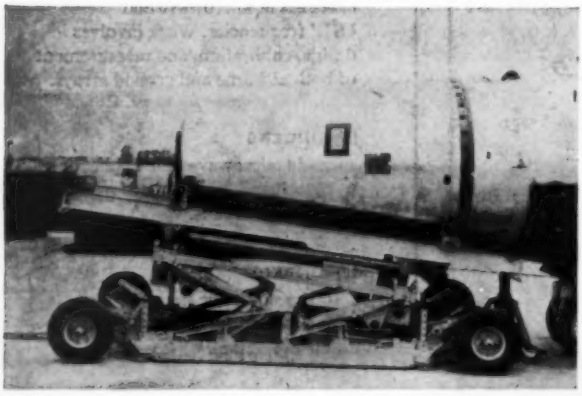
A big—and growing—problem for the military is that of maintaining today's advanced aircraft in a state of readiness. A flight line for a B-52 squadron, for example, stretches out to something like three miles, and that puts the last aircraft a long way out from a hangar.

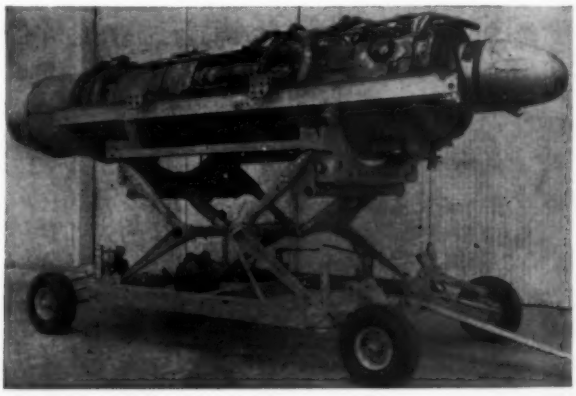
It also might be added that it takes very little effort to clutter up such a length of flight line with various and sundry pieces of ground equipment until it looks like it has been set up for an obstacle race.

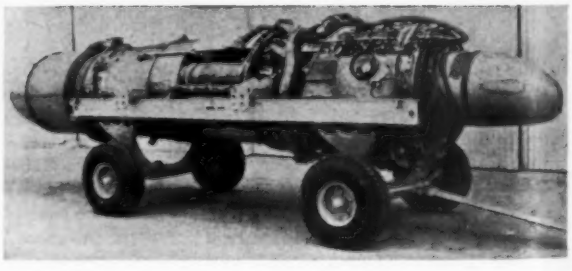
With new jets and turboprops on the way, airlines will be faced with similar problems in laying their plans for the changes they must make in their ground handling and service requirements.

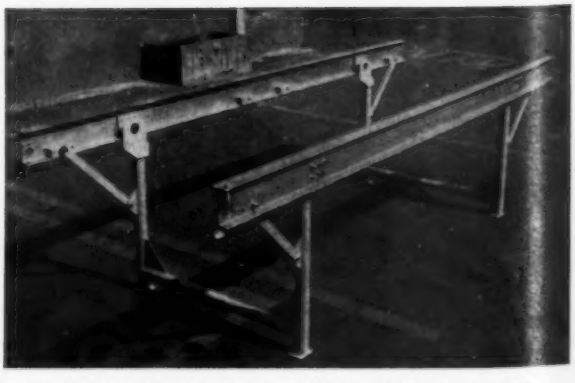
• **Briefly, Air Logistics** may be said to have developed a series of vehicles and gadgets into a new system of ground support. Design revolves around the roll-transfer principle. A series of trailers are utilized for a wide variety of functions in the installation, handling and shipment of jet engines, tail sections, nose sections, pods, missiles, bombs and ammo, tanks and stores, turrets, wing panels, control surfaces and radomes. Universal trailer adapters enable different engines or components to be handled without special equipment.

The roll-transfer trailers save manhours in wholesale lots. For example, the installation of an F-89D external tank or store, which normally takes 45 minutes, is accomplished in five minutes. Two men remove a B-52 flap in 12 minutes. Removal of an aft fuselage from an F-100C takes four minutes.









How Air-Log System works: Positioning trailer is set to remove engine (top left); engine then is moved (top right) to transportation trailer (center photos). The engine roll-over trailer (bottom left) facilitates overhaul through 210-degree irreversible worm gear rotation. Folding work stand is shown bottom right.

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It's no accident that Air Logistics took an aeronautical approach in the basic design objectives of this Air-Log System, as it is called. The company's engineering staff would be at home in any aircraft factory.

Chief design engineer is Morrie Harper, 15 years with Douglas. Jerry Adams, chief administration engineer, had 20 years at Douglas. Design engineer Paul Lansing was in the powerplant group at North American and Convair. Mike Hackney, chief of research and development, drew a Lockheed pay check for 16 years and subsequently was director of military relations for Fairchild.

President of the company, J. F. Schirtzinger, is an aircraft engineer, a former assistant chief engineer at Convair and previously an old Douglas hand.

When the Air Logistics engineers turned their attention to ground equipment it was only natural they should seek something that would perform more efficiently, but would also serve the maximum number of aircraft types and the maximum number of functions on each type. Give it an old familiar word—standardization.

• **Air Logistics** went to work on the elimination of conventional ground handling equipment, such as mobile cranes, fork-lift trucks, slings, etc., by developing a dolly equipped with matching rails so as to employ the roll-transfer principle. Engineers experienced in aviation know how great the cost when a high-priced item, like a jet engine, slips out of a sling or crane and drops on the hard stand. Next step was to put together the basic elements of a complete trailer system and then fit them to as wide a variety of applications as possible.

Basic Units

Here are the basic units of the Air-Log system:

• Model 4000A positioning trailer. This is a heavy-duty trailer utilizing I-section rails that permit engines or components to be roll-transferred to matching rails on other elements of the system. Precision positioning is obtained by a combination of hydraulic and irreversible screw-type actuators which provide fore and aft tilt, roll and yaw together with linear movement in three planes.

• Model 3000 transportation trailer. This is utilized for air, truck and special rail transportation and for ground transportation, build-up, minor repair and storage of jet engines and aircraft components. It is equipped with pintle hooks for towing in train.

• Model 5000 engine-roll-over trailer. It is designed to facilitate jet engine build-up and overhaul through the use of a 210-degree irreversible worm gear rotation feature.

• Model 3100 folding work stand. This utilizes the rail system to provide a stand for inspection, repair, build-up and storage of jet engines and aircraft components.

• Model 3400 yoke hoist. This is a rail-mounted hoist to lift engines or engine sections and is designed to accommodate either a hydraulic hoist with safety latch or a chain hoist.

• Model 6000 mobile work bench. This is a standardized vehicle designed to equip specialized service personnel with tools, test equipment, check-out equipment, standard spare parts and related administrative or technical data in highly mobile form.

Roller Adapters Used

Through the system of roller adapters, these six basic elements provide the flexibility of a complete ground support system. An adapter called the Model 3500, for example, is a universal component adapter capable of handling a wide variety of shapes ranging from a 15-inch diameter to a flat surface, and weights up to 8,000 pounds.

• **Engine adapters** have been designed to provide a link between engine mount pads and the standard roller adapters, which rest or roll on the rails of the various trailers. Through research and design, Air Logistics has developed 35 engine adapters to handle 98 different engine models.

Application of the adapter principle represents one of the important economies of the Air-Log ground support system. Interaircraft capability cuts procurement costs by reducing the number and types of equipment required. The same trailers are used to transfer the aft fuselage section of an F-100C as the nose section of an F-89D.

Future procurement costs also may be reduced when obsolete aircraft are replaced with new aircraft because it will generally be feasible to replace adapters only rather than basic trailer units. The same applies to replacement of work-out equipment.

Simplifies Personnel Training

• **A strong feature** of the Air-Log system lies in the way it simplifies the personnel training problem, which gets tougher by the day with the modern complicated aircraft. The trailers can be operated easily by average-skill personnel, and the repetitive use of the same vehicle for many different tasks helps produce improved personnel proficiency.

Load capacity of the Model 4000A positioning trailer, which is the hub of the system, is 10,000 pounds for positioning; 8,000 pounds for 12 mph ground transportation; 6,000 pounds for 20 mph ground transportation.

It has wheel rotation up to 90 degrees on all wheels to provide easy lateral movement and rotation in confined areas. Its turning radius is 14 feet. It incorporates an irreversible gear-actuated winch to facilitate movement of heavy objects along the rails when the rails are inclined. It has complete wheel retraction to reduce floor-loading and volume for air shipment, and to transfer trailer load from pneumatic tires to adjustable stanchions for solid positioning. It employs front wheel towbar steering.

This vehicle has a 126-inch wheel base and 72-inch wheel tread. Its positioning rails are 152 inches long. Maximum rail height is 84 inches. Minimum is 24 inches.

• **The Model 3000** multiple purpose transportation trailer weighs 532 pounds and has a 10,000-pound capacity. It will handle all jet engines now in production or under development contract and will also handle most demountable aircraft components and some missiles or demountable missile components. It has a 90-inch wheel base and 132-inch rail length.

Air Logistics is now in production on items of the new ground support system at its plant in Pasadena, Calif. ◆◆◆

USAF Accidents Drop To All-Time Low

USAF is having fewer major accidents in 1956 than it had in 1955, despite large-scale introduction of faster aircraft and in the face of a predicted increase this year.

On a per-100,000-hours basis, the major accident rate has dropped from 20 in 1954 to 17 in 1955 and 14.7 so far in 1956, an all-time low, according to Brig. Gen. Joseph D. Caldara, director of USAF's flight safety research.

There were 1,664 major accidents in 1955, of which 885 were in the first six months. This year's first-half total was 739. Minor accidents last year totaled 301, against 120 in the first half of 1956. However, pilot fatalities are up from 388 in 1955 to an annual rate of 412, due to more hours being flown.

Blame for accidents is broken down as follows: pilot error, 47%; maintenance, 3%; materiel failure, 26%; supervisory error, 3%; all other (mostly undetermined), 21%.

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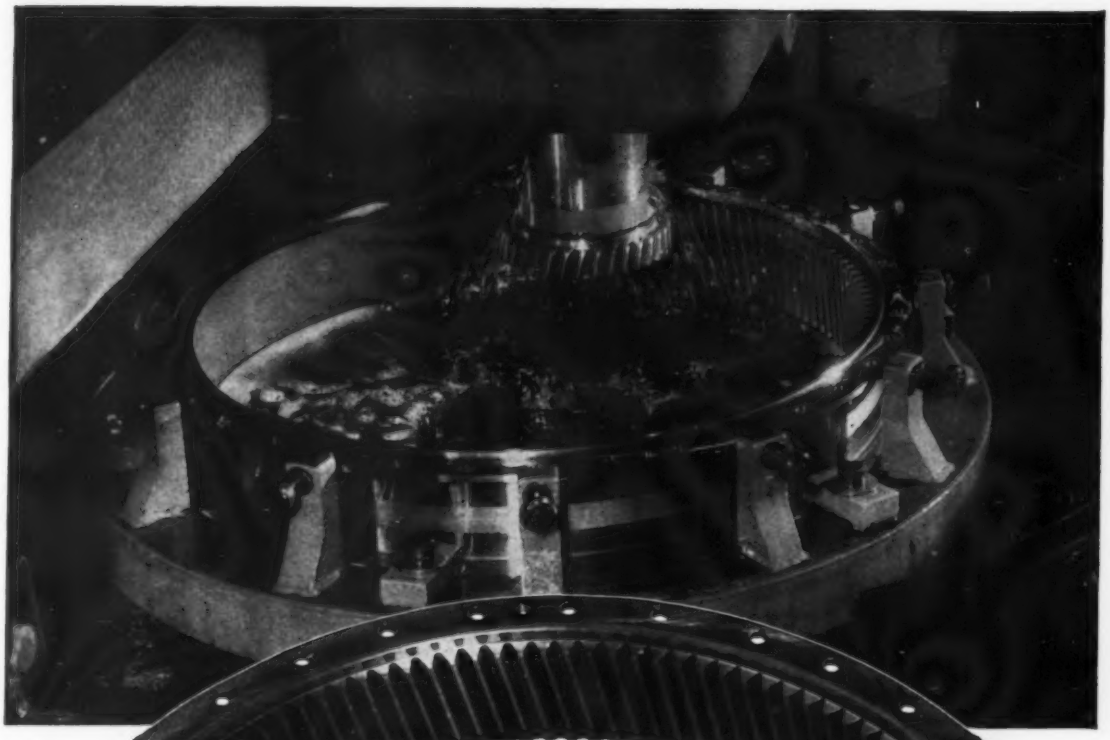

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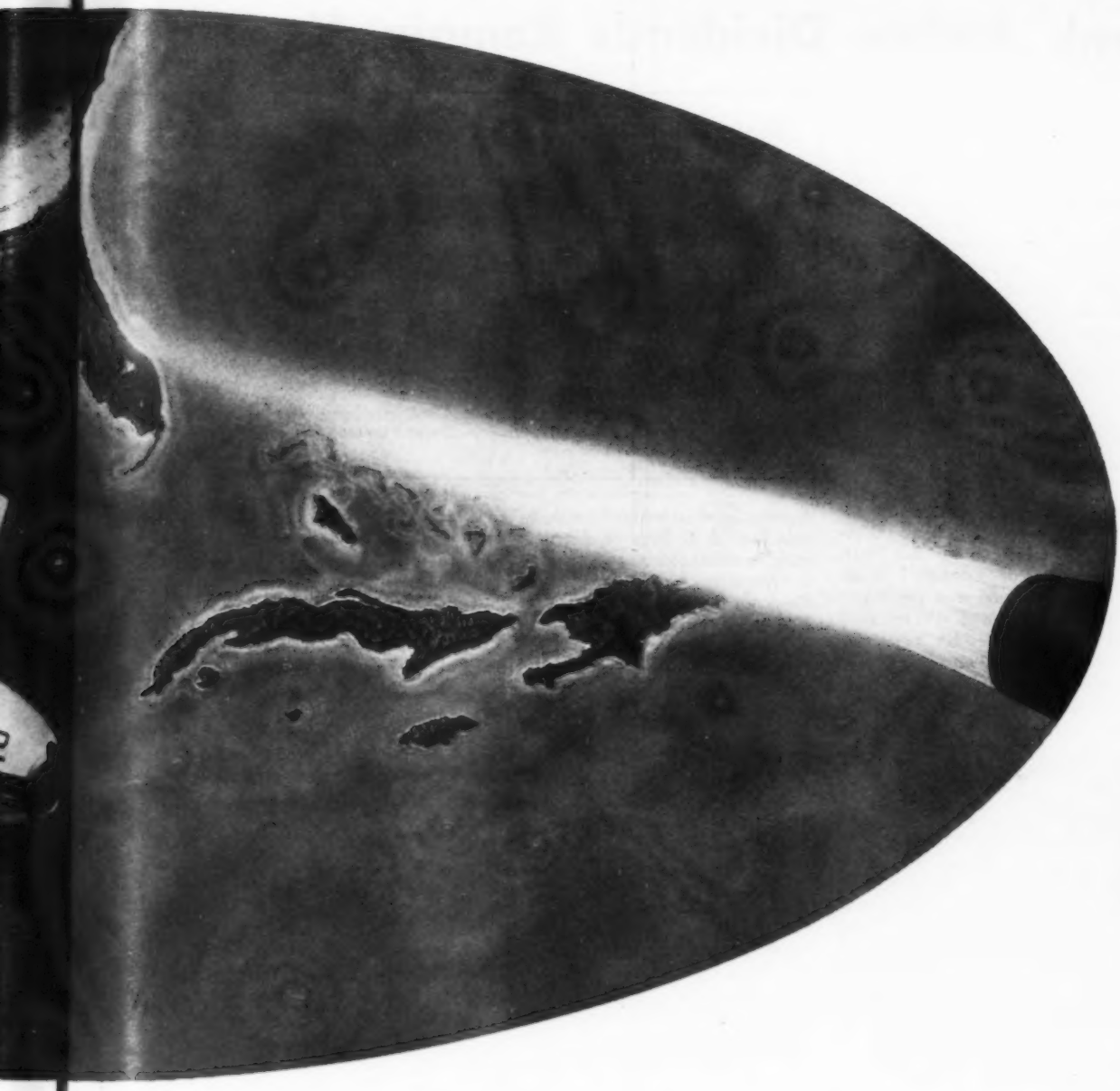

ABOVE THE
CONTINENTS

Even before the close of World War II, North American was at work in the vast technological world of guided missiles. One of today's major results of this pioneering is the SM-64 NAVAHO INTERCONTINENTAL MISSILE. North American has developed guidance systems, automatic navigation and flight control systems . . . as well as airframe and rocket power . . . for this important Air Force project. North American's work on the NAVAHO and other weapons systems is now creating long-range missiles to fill a high-priority need in our nation's defense.

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Trunk Airline Dividends Remain Moderate

By SELIG ALTSCHUL

Cash dividends to be paid by the domestic trunk airlines promise to remain on the low side again this year despite the expectation of a moderate increase in earnings. There has been no diminution of the need by the industry to retain earnings in order to help finance the substantial expansion programs ahead.

For 1955, the domestic trunks paid an aggregate of $18.8 million in cash dividends. This represented a "pay-out" of 29.8% of the industry's reported net income of $63.1 million. By contrast, the average "pay-out" by all American corporations reached 51.6%.

This year the domestic trunk airlines may report an aggregate net income of from $65 to $70 million. (Capital gains, if realized later this year, could improve this estimate.) Cash dividends (on common and preferred) are projected at from $20.5 to $21.5 million. These estimates are, of course, subject to the many uncertainties so peculiar to the airline industry. (Editor's note: In the July 18, 1955 issue of AMERICAN AVIATION the author's estimates for that year were: Earnings, $60 to $70 million; Dividends, $17.5 to $18.5 million.)

Nevertheless, taking the top range in 1956 estimated airline earnings and dividends, the "pay-out" for the group is indicated at 30.7%. This would be slightly above the 1955 experience and substantially lower than the 55% estimated for all U.S. corporate industry this year.

• **Table No. 1** reveals the trend of airline dividend pay-outs as compared with all corporate experience during the past five years and our estimate for 1956. It is clear that airline dividend pay-outs have consistently been well below that of U.S. corporate experience.

In the airline group there are important variations. An exclusive AMERICAN AVIATION compilation (Table No. 2) shows the cash dividend record for all of the domestic airlines for the past four years, 1945, and an estimate for 1956.

While at low levels, cash dividend payments, nevertheless, are taking on the quality of stability through regular quarterly disbursements for many of the carriers.

Stock Dividends Popular

This year has also seen the airlines utilize stock dividends to greater degree. In this manner, cash is conserved while a form of distribution is made to stockholders.

Western Air Lines paid a stock dividend of 4% on its shares on August 20. At recent market quotations, this distribution had a value of more than 80 cents per share. Eastern Air Lines announced that it would supplement its annual $1.00 cash dividend with stock dividends of 2%. In this instance, recent market prices would place a value of better than $1.06 per share on this distribution.

A stock dividend of 25% was paid by Delta on June 29, 1956. However, this represented a transfer of past earnings to the capital stock account rather than a distribution of current earnings. It is significant that by maintaining the same 30-cent quarterly cash dividend payment, Delta's stock dividend action also serves the purpose of increasing subsequent cash payments by 25%.

• **Last year** and in 1954, Capital Airlines paid 5% in stock annually as a means of husbanding cash. It is too early in the year to anticipate what action will be taken by the company as to a stock dividend.

It is likely that other air carriers may resort to modest stock dividends as a means of supplementary distributions to shareholders. Many stockholders, in fact, prefer this form of dividend as it is not subject to Federal income tax and is an effective means of building up equity positions. Stock dividends used in this manner, of course, increase the outstanding share capitalization with the attendant responsibility for management to show earnings on these added shares.

• **Many corporations,** despite the pressures for heavy capital outlays, pursue a definite policy of making consistent cash dividend distributions to stockholders. The purpose is to develop

Table No. 1—Comparative Dividend Disbursements

Year	Domestic Trunk Airlines: Net Profits After Taxes	Dividend Payments	% Div. Payout	U.S. Corporate Experience: Net Profits After Taxes	Dividend Payments	% Div. Payout
	(In millions)			(In billions)		
1951	$ 43.5	$ 12.5	28.7%	$18.7	$ 9.1	48.7%
1952	53.5	12.7	23.7	16.1	9.0	55.9
1953	48.4	13.0	26.9	17.0	9.3	54.7
1954	51.5	15.0	29.1	17.0	10.0	58.8
1955	63.1	18.8	29.8	21.5	11.1	51.6
1956#	65-70	20.5-21.5	30.7	21.5	12.0	55.0
Average 1951-1955	52.0	14.4	27.7	18.1	9.7	53.6

SOURCE: 1951-1955
Domestic Trunk Airlines—CAB & company reports.
U.S. Corporate Experience—Department of Commerce 1956 Estimates our own.

Table No. 2—Domestic Trunk Airlines
Cash Dividends Per Common Share
Actual and 1956 Forecast

	Calendar Years 1956#	1955	1954	1953	1952	1945
American	$1.00	$0.80	$0.60	$0.50	$0.50	$0.20
Braniff	0.60	0.60	0.50	None	None	0.60
Capital	None	(A)	(A)	None	None	0.25
Continental	0.50	0.50	0.50	0.50	0.50	0.15
Delta	1.20*	1.20	1.20	1.10	1.00	0.50
Eastern	1.00*	1.00	0.50	0.50	0.50	0.25
National	1.00	0.80	0.60	0.55	0.50	None
Northeast	None	None	None	None	None	None
Northwest	0.80	0.60	None	None	None	0.50
TWA	None	None	None	(B)	None	None
United	1.50	1.50	1.50	1.50	1.50	0.50
Western	0.80*	0.90	0.60	0.60	0.60	None

NOTES: # Minimum estimate for year.
** Plus stock.*
(A) 5% stock dividend paid in each year.
(B) 10% stock dividend paid January 1953.

higher investor confidence and create an atmosphere of stability in earnings so that additional capital can be attracted on more favorable terms as needed.

This condition is important to the airlines from the competitive capital viewpoint. Obviously, based on cash income return, airline common stocks appear to be at a disadvantage to the established utilities and industrials.

Despite the limitations imposed by the heavy cash requirements, many of the major airlines have increased their dividend rate wherever possible.

American, for example, increased its 1956 annual rate to $1.00 per common share from 80 cents in 1955, 60 cents in 1954, and 50 cents each the three previous years. Of course, the $1.00 dividend rate on the common should also accelerate the conversion of the company's preferred.

Other carriers increasing their regular cash dividends in the last few years include Braniff, National, Northwest and Western.

• **United Airlines** enjoys the most liberal dividend pay-out among the domestic carriers. During 1955, it paid out 39% of earnings to its common stockholders as compared to 42.6% in 1954 and 45.7% in 1953. As contrasted to a previous policy of paying 25 cents quarterly and a year-end extra of 50 cents per share, United is now on a regular 37½ cents per share quarterly basis. This leads some observers to believe that a year-end extra by United for 1956 is highly possible.

On the bottom of the list, Colonial ended its corporate life when it was absorbed by Eastern a few months ago without ever paying a single cash dividend during its entire 26 years of existence.

Northeast (common) has yet to pay a cash dividend. While great expectations are anticipated from its extension into Florida, the staggering capital demands ahead may delay cash disbursements for a while.

Despite the self-generation of funds through depreciation cash throw-offs, the airline industry remains with an almost insatiable appetite for funds to pay for the extensive expansion planned in aircraft and related facilities. While many an air-carrier management would like to be more liberal in paying cash dividends, the bulk of earnings can best be utilized in bolstering the company's capital base to meet financial commitments. This is particularly true with the prevailing tight money market.

◆◆◆

Financial Briefs

• **Lockheed Aircraft Corp.** reported earnings of $7,534,000 on $335,774,000 in first six months of 1956 against $9,089,000 net on $372,751,000 sales in the same 1955 period. Company spent $8,746,000 on research in the first half, mostly for development of the Electra turboprop transport. Military-commercial backlog reached peacetime record of $1,390,648,000 as of June 30, up 31% from a year ago.

• **Edo Corp.** had $309,000 net profit on $3,993,000 sales in first half of 1956 against $203,000 net on $3,112,000 sales in same period last year.

• **West Coast Airlines** showed profit of $50,674 (unaudited) for the first seven months of 1956, as passengers increased 10.5% and passenger revenue 13%. Profit is after all charges but before write-off of additional costs of the Empire Air Lines acquisition. Balance of $50,000 on Empire purchase will be paid as soon as certain items are audited.

• **Los Angeles Airways** reports tentative net loss of $26,964 for 1956 first half, subject to adjustment when final mail rates are established for the period by CAB. Operating revenue of $164,776 included $43,734 passenger revenue.

• **Hughes Aircraft Co.** bought all the stock of Santa Barbara Research Center, Goleta, Calif., a company of 40 employes engaged in research on infra-red detection techniques and electro-optical mechanisms and the manufacture of an infra-red detection device.

• **Belgian** government has approved Sabena Belgian World Airlines $17-million loan from Chase Manhattan and First National City Banks of New York for purchase of new aircraft and parts and to repay advances already made by banks in U.S.

• **North American Aviation** net income for nine months ended June 30 was $22.3 million compared with $23.6 million for like period a year ago. Total income was $636.7 million, compared with $580.3 million last year. Backlog June 30: $1.3 billion.

Bell XV-3 Starts Conversion Trials

Bell Aircraft's XV-3 convertiplane, undergoing general evaluation Phase I flight tests at Fort Worth, has made conversions up to 15 degrees forward from vertical lift. Company says autorotation tests from 500 ft. altitude shows excellent power-off characteristics.

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FOR THE TRAVELING MAN!
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PLAN

• Every single room, with private bath, now $8.85
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• Every twin-bedded room, with private bath, now $12.85

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800 rooms, beautifully decorated. On New York's smart East Side, opposite the Waldorf-Astoria. Easy parking.

A GREAT HOTEL . . . NOW
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Belmont Plaza

Lexington Ave., 49th-50th Sts.
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Or See Your Travel Agent

A TISCH HOTEL

...New York, St. Louis, Los Angeles... everywhere, everybody is bombarding us with questions about

MISSILES AND ROCKETS!

MISSILES AND ROCKETS . . . *The Magazine of World Astronautics.* An American Aviation Publication . . . World's Largest Aviation Publishers, 17 E. 48th St., New York 17, N. Y., 1001 Vermont Ave., N. W., Washington 5, D. C., 139 North Clark St., Chicago 2, Ill., 509 Stephenson Bldg., Detroit 2, Mich., 8943 Wilshire Blvd., Beverly Hills, Calif.

Wayne W. Parrish, Editor & Publisher, and head of American Aviation Publications, answers questions about the basic concept and need...

QUESTION: Why did you feel astronautics needed its own magazine?
ANSWER: *Its fantastic growth demanded an industry type publication uninhibited by society policies and free to establish a strong journalistic program.*

QUESTION: Any conflict with any other publication in the field?
ANSWER: *The American Rocket Society is doing a splendid job with its association "professional" magazine. Its primary responsibility is to reprint "the highly technical papers" presented at Society meetings. We hope to cooperate with it and fully expect it to grow as we grow.*

QUESTION: When will the first issue be published?
ANSWER: *October 1st, and every month thereafter.*

QUESTION: What will the new MISSILES AND ROCKETS do to earn its keep?
ANSWER: *It will serve as a forum for the fast exchange of specialized information and ideas . . . for the scientist, engineer, management, the military concerned with jet propulsion and rocketry . . . and with related fields embracing basic and applied research, the steel and aluminum industries, fuels, the chemical industry and electronics. It will be a "vertical" industry magazine.*

Erik Bergaust, Managing Editor, author, Vice Pres., American Rocket Society, (Washington, D.C. Section), rocket and missiles authority, answers your editorial questions...

QUESTION: What will be the content of MISSILES AND ROCKETS?
ANSWER: *Semi-technical, for maximum interest and utility to engineer and executive. A news and feature publication, covering satellite science, missiles airframe manufacturing, power plant manufacturing, propulsion systems, propellants (solids and liquids), guidance and control systems, ground handling equipment, and astrionics (electronics as applied to astronautics).*

QUESTION: Does not this field demand high technical competency?
ANSWER: *Yes. This is why we have established an Editorial Advisory Board of the most eminent scientists and authorities, representing a special domain within missiles, rocket propulsion, upper air research and satellite science. Our major feature articles will be contributed by specialists and experts in the field. Among the authors this fall — Dr. Wernher vonBraun and Dr. Hugh L. Dryden.*

QUESTION: What is the size and calibre of the working editorial staff?
ANSWER: *Our own news and technical specialists, as well as new journalists now augmenting the largest editorial task force in aviation—the editors of our own Aviation Daily, American Aviation, our other aviation news services and periodicals.*

QUESTION: What do you have lined up for the first issue in October?
ANSWER: *Tentatively . . . looks like an "exclusive" on certain Soviet rocket developments . . . a round-up story on one of our ICBM activities . . . a "special report" on the electronics and data reduction aspects of the Vanguard Program . . . a story on the human relations complications involved in our missile developments, G-E's new communications ideas for missile engineers.*

Leonard A. Eiserer, Executive Vice-President and General Manager, tackles important questions on circulation policy and practices . . .

QUESTION: What will be the circulation of the first issue?
ANSWER: *At launching—a guaranteed circulation of 13,001.*

QUESTION: Will MISSILES AND ROCKETS have a paid or controlled circulation?
ANSWER: *It will sell by subscription only at $8.00 a year. Pursuing a policy of rigid subscriber selectivity, this circulation will eventually be entirely paid and audited. During the interim we will follow the traditional sampling procedure. Special charter subscription rates prior to publication — 1 year for $4 for the U. S., Canada, or 2 years for $6.*

QUESTION: What about the distribution of this circulation?
ANSWER: *Our pre-publication research and highly selective circulation planning shapes up like this:*

1. AVIATION MANUFACTURING		
a. Air Frame Missile Rockets	3,380	
b. Power Plant	1,690	
c. Components	4,551	
		9,621
2. Research & Development Companies, Consultants		520
3. Oil, Gas and Chemical Mfg.		1,040
4. Metal and Ceramic Mfg.		390
5. Government, including Military		1,300
6. Miscellaneous		130
MINIMUM GUARANTEE October Issue		13,001

William H. Pearson, Vice-President and Advertising Director, answers your questions about space...

QUESTION: What is the size of the market your new magazine covers?
ANSWER: *The missile and rocket industry has climbed from a $21-million business in 1951 to well over $1 billion today. Should double in two years. Research and development alone — $268-million this year. The Air Force is putting 20% of its budget into missiles, only 4% a few years ago. By 1958—35%.*

QUESTION: What are your rates?
ANSWER: *On a black and white page basis, from $545 (1-time) to $437 (18-times). Charter rate for advertisers contracting now for the first 3 issues of MISSILES AND ROCKETS (Oct., Nov., Dec.)—black and white page for these (3) consecutive issues—$750 total. These insertions will not be applied to contracts beginning after the October issue.*

QUESTION: Any special positions available?
ANSWER: *At this time (mid August) most cover positions are "sold" through 1957. One inside cover spot open — several preferred positions inside the book. Wire!*

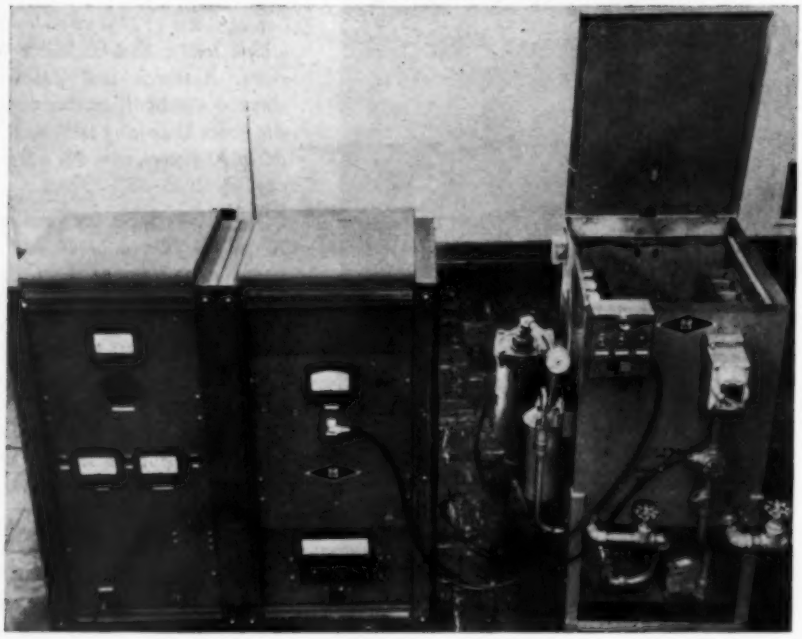
QUESTION: What has been your initial acceptance?
ANSWER: *Advertisers and agencies are enthusiastic. Currently we have commitments from over 40 advertisers representing space reservations for 80 pages for the first 3 issues.*

QUESTION: What advertisers have the most to gain from this medium?
ANSWER: *Every company interested in reaching design, specifying and purchasing people via this new, unparalleled vehicle . . . unparalleled in market coverage—in its low cost and effectiveness.*

QUESTION: Whom can I contact?
ANSWER: *Just mail your space contract right to me at 17 E. 48th St., New York City . . . or wire our nearest district manager.*

New Products and Processes

CURTISS-WRIGHT ULTRASONIC CLEANER



Curtiss-Wright Corp.'s Industrial and Scientific Products Division has developed an ultrasonic cleaner, the CB1-60, for the maintenance cleaning of aircraft engine parts.

The unit has a single-stage tank measuring 20″x24″x40″ that provides a working space of 12″x12″x12″. It utilizes barium titanate transducers. Included in the unit are a circulating and solvent cooling system, drainable and protected pitch sludge sump, explosive-proof pump motor and switch, automatic cut off-and-on switch for the ultrasonic generator solvent filter, valves and soundhead protectors.

The C-W cleaner requires 5 kw at 220 volts, 60-cycle, single-phase input. The generator can be operated remotely by the tank operator.

Circle No. 150 on Reader Service Card.

VIBRATION TESTING SYSTEM

A vibration testing system for missile or aircraft structures and their components that incorporates a new principle utilizing electronically actuated hydraulic power amplification will be produced by **Wyle Manufacturing Corp.** under exclusive license from Northrop Aircraft, Inc.

The Hydrashaker will provide accelerations up to 100 gs with .2″ total displacement and 20,000-lb. block force. It has been field-tested in a prototype constructed by Northrop for vibration evaluation tests on its Snark missile.

The equipment is expected to have a useful frequency range of 5 cps to 2,000 cps. The vibrator will be powered by a 75-hp, motor-driven, 3,000 psi hydraulic pump. An electronic exciter console with monitoring instrumentation facilities will be included.

Circle No. 152 on Reader Service Card.

X-RAY INSPECTION

Andrex portable X-ray equipment, manufactured by **Holger Andreasen, Inc.,** is being used for inspecting bank manifolds for defects in a standard 1,300-hour maintenance check at Pan American World Airways' base in San Francisco.

The equipment, which operates on any 110-volt or 220-volt supply without special transformer, may be used for inspection of radiators, rocker box covers, harnesses, cylinders and fuselage structures. Defects in shielding conductor wire and terminal ends are also pin-pointed by X-ray for repair.

Circle No. 153 on Reader Service Card.

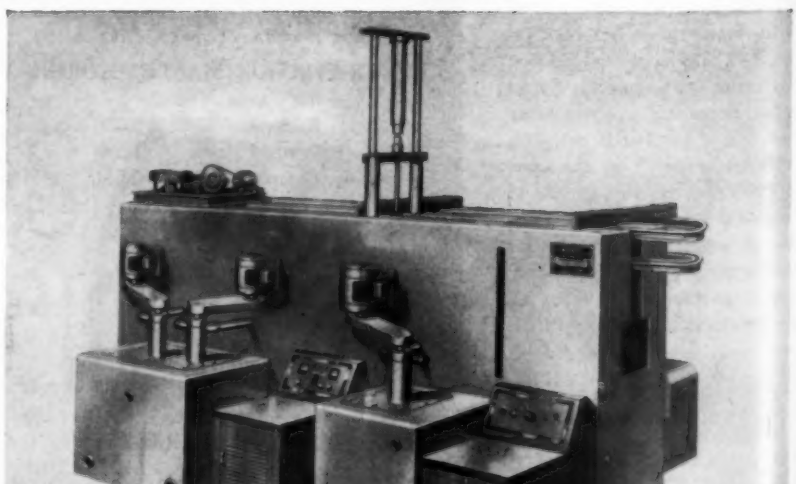
RANSOHOFF ULTRASONIC CLEANING SYSTEM

A completely automatic ultrasonic cleaning system developed by **Ransohoff, Inc.** combines a single ultrasonic cleaning stage with conventional wash, rinse and dry sections. The ultrasonic unit itself was manufactured by Bendix.

With this machine, blind holes and difficult recesses of castings, engine parts, stampings, valve bodies and other parts can be cleaned with what is described as amazing speed. Parts are carried through the machine on an automatic indexing double monorail conveyor.

Ransohoff engineers say the machine is at least three times more effective than any other method of cleaning parts and assemblies. Grease, lapping compounds, cutting oils, abrasives and other contaminants are removed almost 100% effectively. Labor savings are said to amount to as much as 75%. Rejects due to unsatisfactory cleaning are virtually eliminated.

Circle No. 151 on Reader Service Card.



FUEL TRANSFER PUMP

Propulsion Research Corp., a subsidiary of Curtiss-Wright, has developed a reliable, simplified fuel transfer pump that provides specified quantities of fuel at various altitudes.

Designated the Model 102 turbopump, the unit was first used on the Douglas A4D fighter bomber. Its rated fuel flow is 10,000 lbs. per hour at any altitude from sea level to 48,000 ft. Airflow is less than 6 lbs. per min., maximum environmental temperature 250°F.

Driven by compressed air, the pump requires no linkages or electrical power supply. The entire unit weighs 8.1 lbs. measures 10″ high and 7¾″ in diameter.

Circle No. 154 on Reader Service Card.

MINIATURE HARNESS REEL

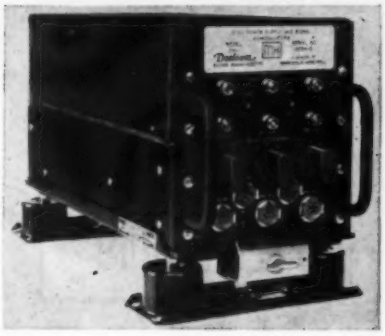
Pacific Scientific Co. has developed a miniature harness reel that is said to provide increased comfort and safety for aircraft personnel.

The reel, designated HR-40, works against force tending to hurl the user in any direction, locking when the occupant moves in excess of 2 gs. Weighing just one pound, it will withstand a minimum load of 4,000 lbs. at any strap extension.

The unit allows full mobility and freedom of action. It may be mounted without regard to orientation in the aircraft. Accessory variations allow adaptation to all seating systems, including integral-suit arrangements.

Circle No. 155 on Reader Service Card.

POWER SUPPLY-DEMODULATOR

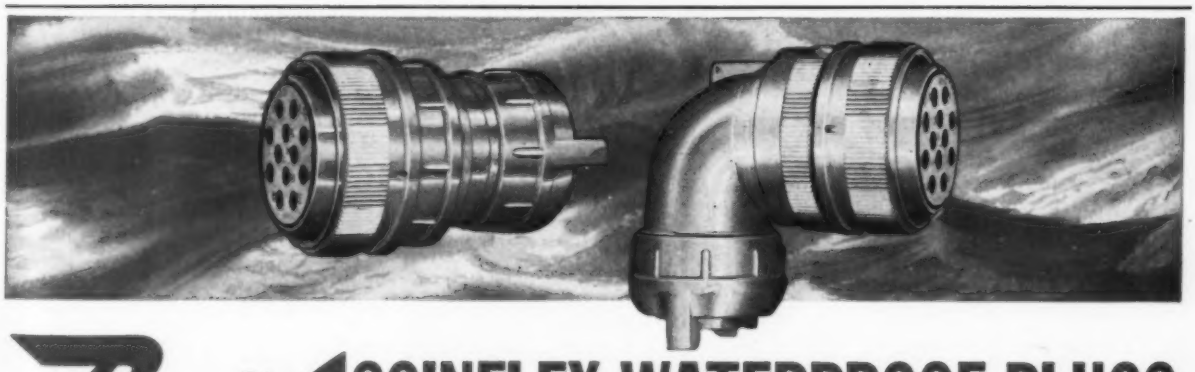


A regulated power supply-demodulator unit, for use with gyros in flight-test applications where 115-volt 400-cycle single-phase primary power is available, has been developed by **Doelcam,** a division of Minneapolis-Honeywell.

Designated Model DV-1, the unit has been designed for use with one to three Doelcam Model K rate measuring gyroscopes to comprise a complete rate-measuring system.

Model DV-1 energizes the motor and pickoff of each gyro and converts the ac output signal of each pickoff to dc for use with oscillograph galvanometers. Literature available.

Circle No. 156 on Reader Service Card.



Bendix SCINFLEX WATERPROOF PLUGS

FOR USE WITH MULTI-CONDUCTOR CABLES!

These new Bendix*-Scinflex *waterproof* plugs are a modification of our standard AN type "E" (environment resistant) connector. They are designed to meet all "E" performance requirements when used with multi-conductor cables. Each plug includes a modified AN-3057B cable clamp which provides inward radial compression on multi-conductor cables. This unique feature completely eliminates cable strain—a common source of circuit trouble.

In addition, there are gaskets at all mating surfaces and an accessory sleeve is available to accommodate an extreme range of cable sizes. A descriptive folder is available on request.

*TRADE-MARK

THESE BUILT-IN FEATURES ASSURE TOP PROTECTION AGAINST CIRCUIT FAILURE:

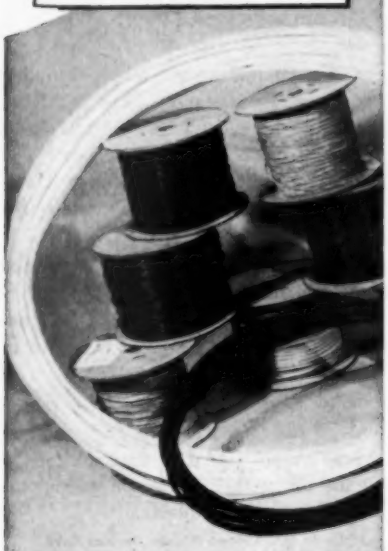
Shock and Vibration Resistant • Die Cast Aluminum Shell • Cadmium Plate—Olive Drab Finish • Moisture-Proof, Pressurized • High Arc Resistance, High Dielectric Strength • Silver-Plated Contacts • Resilient Inserts

Bendix SCINTILLA DIVISION OF Bendix AVIATION CORPORATION
SIDNEY, NEW YORK

Canadian Affiliate—Aviation Electric Limited, 200 Laurentien Blvd., St. Laurent, Montreal 9, Quebec, Canada

Circle No. 22 on Reader Service Card.

SPAGHETTI TUBING
MADE FROM
TEFLON*



For SLIP-ON INSULATION
BUNDLE SHEATHING
BUSHING INSULATION
BARRIER INSULATORS, PIGTAILS

And Similar Applications Where Only PF TEFLON Can Do The Job*

ADVANTAGES . . .

- good dielectric strength (500 to 1000 volts/mil)
- lowest dielectric constant (2.0) and dissipation factor (0.0002) of any solid dielectric
- no change of electrical properties with temperature (-25°C to +250°C) or frequency (60 cycles to 100 mc).
- zero moisture absorption
- unaffected by any commercial chemical

PF spaghetti tubing is stress relieved for minimum shrinkage and carefully inspected and controlled dimensionally. A full range of sizes and colors are available to meet your specific needs. Write, wire or call for further information, competent engineering assistance and information on special sizes and walls. PF flexible tubing, heavy-walled tubing and rod stock made from Teflon* is also available.

PENNSYLVANIA
FLUOROCARBON CO., INC.
1115 N. 38th Street, Philadelphia 4, Pa.
EVergreen 6-7680

*"Teflon"—DuPont trade name for Tetrafluoroethylene resin

Circle No. 14 on Reader Service Card.

PRESET CONTROLLERS

Computer-Measurements Corp. has announced a series of preset controllers for automatically counting and controlling up to 1,000,000 electrical, mechanical or optical events which can be converted into electrical impulses.

The Model 310 series comes in five models, ranging from 2 to 6 decades. Any one of these models will control any operation or activate an alarm after a preselected total count has been reached.

Circle No. 157 on Reader Service Card.

THREE-DIMENSIONAL FABRIC

A three-dimensional fabric said to offer unusual riding comfort as a result of its structure, which allows the free circulation of air between the person and the seat, has been developed by the **U. S. Rubber Co.**

Trade-named Trilok, the fabric has been used for the first time in the Sikorsky S-58 helicopters of New York Airways, Inc. Besides being used as seating upholstery, it is also installed on walls, ceiling and hatracks because of its sound-proofing effect, cushioning ability and light weight.

Design and color innovations were created by the Quantacolor Co. An exterior color pattern of blue, white and gray is used in the New York Airways copters.

The fabric can be obtained in thicknesses of from 1/64th inch to one inch. Woven from conventional fibers and polyethylene yarn, the fabric is dipped in boiling water, causing the polyethylene to shrink and the fabric to form puffs, producing a sculptored effect.

Circle No. 158 on Reader Service Card.

Product Briefs

• **Waterman Engineering Co.** has developed a pressure relief valve for aircraft, missiles and rockets that meets the exacting requirements of MIL-V-5523C (proposed). They are available in either in-line or tee configuration.

Circle No. 159 on Reader Service Card.

• **White-Rodgers Co.** has introduced a 400 cps Servo-controlled flat-package actuator for airborne applications. It may be operated from magnetic, transistor or vacuum-tube amplifiers and can be supplied in two output torque ratings: 100 in.-lbs. at stall and 50 in.-lbs. at 1.8 rpm and 50 in.-lbs. stall and 25 in.-lbs. at 3.6 rpm. Available with or without ac tachometer feedback for stabilization purposes.

Circle No. 160 on Reader Service Card.

• Thin-wall Polypenco Teflon tubing manufactured by **The Polymer Corp. of America** is said to provide efficient insulation in the miniaturization of telemetering equipment used in aircraft and missile research and development.

Circle No. 173 on Reader Service Card.

• **The Weatherhead Co.,** Aviation Division offers Teflon flexible hose in sizes -4 to -20, tested at requirements exceeding those of MIL-5511 and of airframe and engine manufacturers.

Circle No. 175 on Reader Service Card.

• "Bondized" sheets and tape of Kelon-T (Teflon), available from **Shamban Engineering Co.,** can be cemented to steel, aluminum, wood, plastics, cardboard, etc.

Circle No. 176 on Reader Service Card.

• Loewy-Hydropress Division, **Baldwin-Lima-Hamilton Corp.** has developed a package unit adaptable to any conventional hydraulic press. By means of the Marform process, package units may be used for forming parts where finish is critical and shape is complex. Marform pads are interchangeable to meet specific pressure and blank-size requirements.

Circle No. 177 on Reader Service Card.

• Pan American World Airways is installing a new elapsed-time aircraft clock, the **Wakmann Watch Co's.** 618/24, as standard equipment in its DC-7s. The 618/24 is a simplified chronograph made with either a 12-hour or 24-hour dial, center sweep second and hour hands. They are made to USAF Spec MIL-C-9196, to fit standard panel openings.

Circle No. 178 on Reader Service Card.

Career Pilot

MAJOR HUBERT D. GADDIS
" a man of firsts "

For 14 years, Major Hubert D. Gaddis has been an Army aviator, beginning in 1942 as a private in the liaison pilots course, one of the very first classes offered in Army Aviation.

After airborne service in Europe, he attended Bell Aircraft's first helicopter mechanics course, and in 1947, graduated from Bell's first helicopter pilots' school. The following year, he organized the Army's first rotary wing pilot training at Fort Sill.

Oklahoma-bred Maj. Gaddis went to Korea as commanding officer of the 8191st and 8192nd Army Helicopter Evacuation Units and of the first helicopter medical evacuation company.

Major Gaddis is currently director of the Rotary Wing Section of the Army Aviation Center, Fort Rucker, Ala. He is an Army Career pilot, the best kind of help and guidance for the Army's new aviation cadets.

In order to accomplish its airborne missions, the Army needs aircraft capable of operating from whatever areas are available at the front lines. The helicopter provides this capability and the Army trains its personnel to take the fullest advantage of the unlimited utility of rotary wing aircraft.

Helicopters need pilots and mechanics!
Apply to Army Aviation for career training!

BELL
Aircraft CORP.

TEXAS DIVISION
P. O. BOX 482
FT. WORTH, TEXAS

Circle No. 23 on Reader Service Card.

VICKERS

AIRBORNE HYDRAULIC IN-LINE RELIEF VALVES

setting a new standard of airborne relief valve performance

3000 psi series. Available in ¼", ⅜", ½" and ¾" tube size (¾" not shown)

Exceptionally "flat" performance, negligible hysteresis, minimum pressure sag at high temperature, outstanding accuracy and durability . . . these are the important characteristics of Vickers Airborne In-Line Relief Valves. • They have a direct-operated poppet with a high spring force (at low spring stress) available for reseating. Sliding parts are hardened steel and there are **no sliding o-rings.** A flow-compensating device permits very low differential between full flow pressure and reseat pressure . . . less than 300 psi for 150% rated flow on all sizes! • Conform in envelope to MS-28887 and internal parts have been developed to qualify in accordance with MIL-V-5523B Type II Specifications (reverse flow excepted). Adjustable to deliver rated flow over the range of 2300 to 3850 psi. • Tests at 550°F and severe vibration (25G's up to 2000 cps) indicate excellent performance under these conditions.

Write for Bulletin A 5212.

note low pressure change between full flow and reseat

VICKERS INCORPORATED
DIVISION OF SPERRY RAND CORPORATION
ADMINISTRATIVE and ENGINEERING CENTER
Department 1502 • Detroit 32, Michigan

7493

Application Engineering and Service Offices: El Segundo, California, 2160 E. Imperial Highway • Detroit 32, Michigan, 1400 Oakman Blvd. (Service Only) Arlington, Texas, P. O. Box 213 • Washington 5, D.C., 624-7 Wyatt Bldg. • *Additional Service facilities at:* Miami Springs, Florida, 641 De Soto Drive
TELEGRAMS: Vickers WUX Detroit • TELETYPE "ROY" 1149 • CABLE: Videt
OVERSEAS REPRESENTATIVE: The Sperry Gyroscope Co., Ltd.—Great West Road, Brentford, Middx., England

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Circle No. 25 on Reader Service Card.

New Companies & Divisions

B. F. Goodrich has combined manufacturing and selling functions of its aeronautical departments into a single division to be known as B. F. Goodrich Aviation Products. P. W. Perdriau is general manager and E. H. Fitch general manager-sales.

Hardman Tool and Engineering Co. established a flight safety accessory division headed by K. M. Barnes. Emphasis will be on research and project development activities.

Automation Electronics Inc., 231 W. Olive St., Burbank, Calif., is a new electronic equipment manufacturer. President is Frank G. Jameson.

Thermo Materials Inc., 1275 Harrison St., San Francisco, is a new company specializing in development and production of precision high temperature ceramics, including those for rockets, missiles and jet engines and electronic components.

Berkeley Division of Beckman Instruments Inc., Richmond, Calif., has established a branch facility in Toronto, Canada.

American Machine & Foundry Co. established an advanced research department as part of the AMF defense products group at Alexandria, Va. Manager is E. R. Corvey.

Facilities

Cannon Electric's engineering groups, with the exception of industrial engineering, moved into the company's new 30,000-sq. ft. administration and engineering building, 3208 Humbolt St., Los Angeles.

Cessna Aircraft Co. is buying 37 acres at Wichita Municipal Airport and will build a hangar, apron and other facilities associated with manufacture of the T-37 jet trainer and four-engine Model 620 executive plane.

Hamilton Standard Div. of United Aircraft Corp. broke ground for a 370,000-sq. ft. plant addition, scheduled for completion next summer.

Raytheon Mfg. Co. bought 15 acres at Galeta, near Santa Barbara, Calif., for a new engineering lab to be used in design and development of airborne electronics and infrared equipment.

Rohr Aircraft will establish a $500,000 assembly plant at Auburn, Wash., for assemblage of jet power pods for Boeing KC-135 tankers and 707 jet transports.

Republic Aviation Corp. plans to double facilities of its guided missiles division, which now has 120 engineers and 30 shop mechanics. Main missile engineering and administrative offices are expected to move from Hicksville to Mineola, N.Y. and former space will be devoted to additional missile research and production activities.

The Glenn L. Martin Co.'s $10 million Titan intercontinental ballistic missile plant near Denver is one-fifth complete and manufacturing operations are scheduled to start by the end of the year.

Contracts

Ex-Cell-O Corp., Lima, O., $1,500,000, additional facilities for jet engines and MA-1 gas turbine compressors.

Luria Steel & Trading Corp., New York, $1,473,164, MB-3A aircraft servicing docks for B-52.

Perkin-Elmer Corp., Norwalk, Conn., $1,480,090, design, development and fabrication of optical tracking equipment.

Hughes Aircraft, Culver City, Calif., $1,180,393, continuation of research and development.

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., $4,393,473, components of automatic pilot, spare parts, special tools and data.

Canadian Commercial Corp., Washington, D.C., $2,169,613, L-20A airplanes, spares and ground support equipment.

General Electric Co., Syracuse, N. Y., $1,436,500, radome ancillary equipment.

Motorola Inc., Chicago, $1,246,096, radar set, spare parts.

Lear Inc., Grand Rapids, Mich., $1,692,641, automatic flight control system.

National Presto Industries, Eau Claire, Wis., $5,379,279, F-100 pylons.

Temco Aircraft Corp., Dallas, Tex., $5,350,455, F-100 pylons.

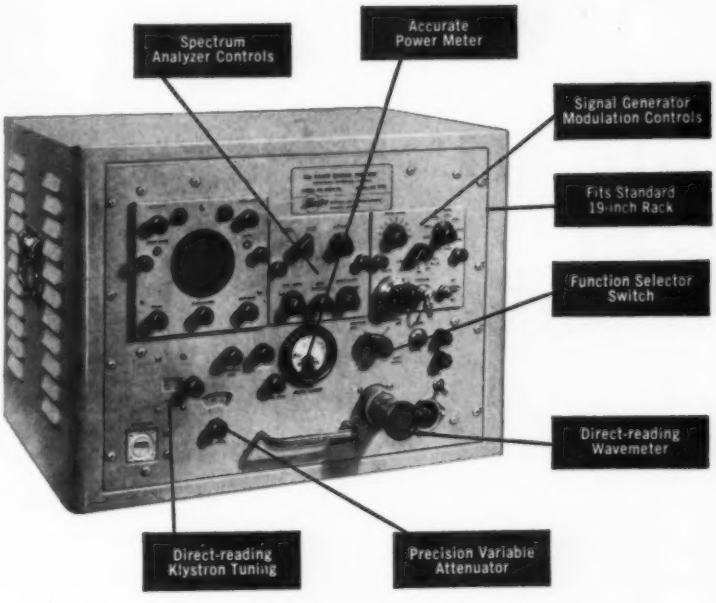
Fairchild Engine & Airplane Co., Long Island, N.Y., $4,900,000, turbojet engines.

Kearfott

RADAR TEST SET*

Completely checks both transmitter and receiver operations in the field or on the production line

*Available for Ku, C, or X-Band Frequencies



KEARFOTT UNIVERSAL RADAR TEST SETS

A complete radar testing facility – includes Spectrum Analyzer, accurate Power Monitor, direct-reading Frequency Meter, versatile Signal Generators complete with variable pulse, saw tooth and square wave modulation. New improved design reduces testing time with increased accuracy. Operates on 60, 400 or 1200 cycles power.

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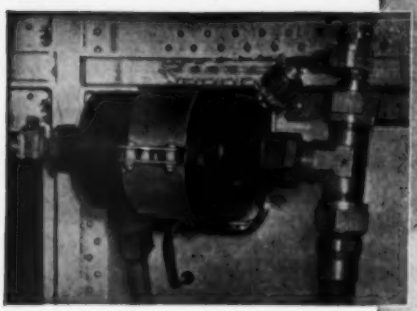

Point of no Return

When a USAF TM-61 Martin Matador leaps from its launcher, it has passed its point of no return. Its mission calls for a one-way trip to the target. The Matador must function perfectly if its mission is to be accomplished. There is no turning back for repairs.

Fuel flow plays a vital part in sending the Matador to its objective. At the speed it travels even a momentary interruption could cause serious deviation in flight characteristics. Martin needed a filter to remove foreign material from the fuel. A filter that would function perfectly, yet be expendable, light in weight, resistant to corrosion. The filter had to have a minimum shelf life of two years. They came to Purolator for a special design.

The Purolator filter designed for use in the Matador filters down to 5-10 microns at a flow rate of 18 GPM. It can be connected directly to auxiliary fuel tanks outside the missile so that fuel on board is not consumed during pre-flight calibration operations. Its construction is resistant to corrosion, has the required shelf life, yet it is lightweight and expendable. A perfect example of Purolator's ability to engineer and manufacture filters for special needs . . . no matter how stringent the requirements are.

PUROLATOR

PRODUCTS, INC.

"FIRST IN THE FIELD OF FILTERING"

Rahway, New Jersey and Toronto, Ontario, Canada

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the new TURBO-PROP VICKERS VANGUARD

THREE TIMES NORMAL FREIGHT CAPACITY! The double deck design of the new Vickers Vanguard is the answer to the problem of how to carry a high payload even during night or off-peak periods without modifying the aircraft in any way. Two extensive lower deck cargo holds provide three times the freight capacity of its closest rival. With a working height of over four feet in the holds, and doors over five feet wide, not only is freight handling faster and easier, but simultaneous loading and unloading is also possible. Such large cargo holds allow an economic freight payload with only 30% of passenger seats sold. Moreover, the lower deck can be filled with low density freight when carrying a full passenger load. In either case no modifications in layout are needed.

GREATER SPEED, GREATER RANGE! The turbo-prop Vickers Vanguard is designed to carry up to 115 passengers on medium and long ranges up to 2600 miles, cruising at speeds as high as 425 m.p.h.

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RESERVED FOR YOU: this interesting, fact-packed booklet Send today. Booklet shows our facilities, names our customers. It introduces you to on-time, precision production. Write Mechanical Division, Dept. AMA9, General Mills, 1620 Central Ave. N.E., Minneapolis, Minn.

***MECHANICAL DIVISION OF* General Mills**

Circle No. 27 on Reader Service Card.

Contracts

Air Materiel Command has announced the following contracts:

Bendix Radio Div., Baltimore, $19,789,120, radar sets.

Merganthaler Linotype Co., Brooklyn, N. Y., $13,040,936, computers, spare parts, special tools.

Hughes Aircraft Co., Culver City, Calif., $11,123,135, fire control systems and support equipment.

Sikorsky Aircraft Div., United Aircraft Corp., Bridgeport, Conn., $10,032,500, helicopters.

Gilfillan Brothers Inc., Los Angeles, $7,790,947, radar sets.

Link Aviation Inc., Binghamton, N. Y., $7,007,434, attachments, spare parts, data and services.

Radioplane Co., Van Nuys, Calif., $5,110,702, aerial target drones and ground launching equipment.

Lear Inc., Grand Rapids, Mich., $4,350,400, indicators, controls, spare parts, special tools and data.

Stroukoff Aircraft Corp., West Trenton, N. J., $4,000,000, aircraft, modification program.

Melpar Inc., Falls Church, Va., $3,101,355, flight simulator and spare parts, special tools and test equipment, data and installation services.

Summers Gyroscope Co., Santa Monica, Calif., $3,047,135, indicator controls, spare parts, special tools and data.

Lumen Inc., Joliet, Ill., $2,301,277, electrical power switching group.

AiResearch Mfg. Co. of Arizona, div. of The Garrett Corp., Phoenix, Ariz., $2,233,017, power units, gas turbine, maintenance tools and test equipment, spare parts and data.

Solar Aircraft Co., San Diego, Calif., $2,049,279, gas turbine generator sets and data.

National Cash Register Co., Dayton, O., $1,995,811, constant speed drives, reproduction and special tooling.

Sundstrand Machine Tool Co., Sunstrand Aviation Div., Rockford, Ill., $1,541,736, transmission assemblies.

Weston Electrical Instrument Corp., Newark, N. J., $1,533,140, indicator, spare parts, ground support equipment and data.

Continental Aviation & Engineering Corp., Detroit, $1,500,000, additional engine facilities.

Boeing Airplane Co., Seattle, Wash., $4,250,000, additional missile facilities; $4,409,336, flight test program for KC-135A.

General Tire & Rubber Co., Akron, O., $4,845,236, wheel and brake assemblies.

North American Aviation, Palmdale, Calif., $5,000,000, additional flight test facilities to support F-100 aircraft.

General Precision Laboratory Inc., Pleasantville, N.Y., $5,570,235, radar set components.

Kearfott Co. Inc., Little Falls, N.J., $1,018,544, components for computer system; $1,808,081, components for J-4 compass system.

Temco Aircraft Corp., Dallas, $1,025,758, UHF installation on F-84Gs.

Weston Electric Co., New York, $1,100,000, radar development.

Collins Radio Co., Cedar Rapids, Ia., $1,105,265, radio receivers, dynamotors and spares.

Emerson Radio & Phonograph Corp., Jersey City, N.J., $1,142,418, radar sets, spare parts and tools.

AVCO Mfg. Corp., Stratford, Conn., $1,276,548, R1820 engines; $1,812,358, R1300 and R1820 engines.

United Aircraft Corp., Windsor Locks, Conn., $1,306,800, combustion starters.

Borg-Warner Corp., Pasadena, Calif., $1,358,517, signal generators.

Kollsman Instrument Corp., Elmhurst, N.Y., $1,384,487, MA-1 altimeters.

Sundstrand Machine Tool Co., Rockford, Ill., $1,398,827, F-102 constant speed drives.

Radio Corp. of America, Camden, N.J., $2,753,139, flight control equipment.

The Commerce Dept. announced the following contract awards. Unless otherwise indicated, contracts are with USAF:

North American Aviation, Inc., Columbus, O., $7,485,408, modernization of FJ-3s.

Hazeltine Electronics Corp., Little Neck, N.Y., $3,240,557, radar sets.

Belock Instrument Corp., College Point, N.Y., $3,839,362, bombing data computer.

Air Associates Inc., Teterboro, N.J., $1,138,952, cowl flap actuators.

AiResearch Div., The Garrett Corp., Phoenix, Ariz., $9,303,171, Navy contract for gas turbine compressors.

Another Scott R & D Achievement!

In flight or ejected, his life is Scott Protected

A Completely Integrated System of High Altitude Breathing & Survival Protection

For a quarter of a century the practical results of Scott Research and Development have enabled Scott Aviation to maintain its leadership in aviation breathing equipment. Now Scott announces production of a completely integrated system of high altitude breathing and survival protection, so necessary for the pilot in today's high performance, supersonic military jet aircraft.

Whether in flight or ejected, breathing protection is automatically maintained. In an emergency, aircraft main supply lines are disconnected automatically and the self-contained unit is actuated without human effort. Simplification is the keynote of this new Scott System. The usual maze of hoses and wires has been eliminated . . . with considerable weight saving.

For the shape of things to come, keep an eye on Scott R & D!

NOW READY FOR PRODUCTION

Scott has ever been cognizant of the importance of Applied Human Engineering. This new high altitude survival protection system is an example. It is past the experimental stage and is ready for production. Further information available to persons active in this field. Write for it today!

SINCE 1932 Scott AIR SAFETY · FOR SERVICE

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Circle No. 30 on Reader Service Card.

Turboprop transports with set records on

THE LOCKHEED YC-121F, powered by four Pratt & Whitney T-34 turboprop engines, is the world's fastest propeller-driven transport. The aircraft cruises at 420 mph.

A PRATT & WHITNEY AIRCRAFT T-34 turboprop engine is loaded aboard a YC-97J Boeing Transport.

MATS COMMANDER Lt. General Joseph Smith cites the engine's record: "My Continental Division reports that these power plants require considerably less maintenance than that required for any of our larger transport engines in common use. This remarkable record forecasts the fine service we can expect from the Douglas C-133A transports which will soon be in MATS operation." Pratt & Whitney Aircraft is most grateful for the magnificent accomplishments of MATS which are contributing very substantially to the success of the T-34.

T-34 engines MATS World Routes

6000-horsepower T-34s show their stamina in Boeing and Lockheed transports

The Military Air Transport Service is already using Pratt & Whitney Aircraft T-34 engines in Boeing YC-97Js and Lockheed YC-121Fs on its world routes. This engine also powers the Douglas C-133A, the highest payload production transport ever to go into service.

The outstanding service performance of the T-34 engine is another example of Pratt & Whitney Aircraft's continuing leadership in design, development and production of dependable engines.

New records include—

- A Lockheed YC-121F flight from over Gander, Newfoundland, to abeam of Shannon, Ireland, in 4 hours and 13 minutes.
- Boeing YC-97J round trips from Texas to Germany and Japan, the first turboprop transport flights across both Atlantic and Pacific.
- A new in-service MATS record, set when two YC-97Js flew a total of 46 hours and 35 minutes during a single 24-hour period.

EACH BOEING YC-97J has accumulated over 1000 flight hours and their engines are already operating over 500 hours between overhauls. These aircraft have maintained 6.1 hours daily utilization during a single month, demonstrating the reliability of the airframe, propeller, engine combination.

PRATT & WHITNEY AIRCRAFT

Division of United Aircraft Corporation • Main Office and Plant: East Hartford, Connecticut
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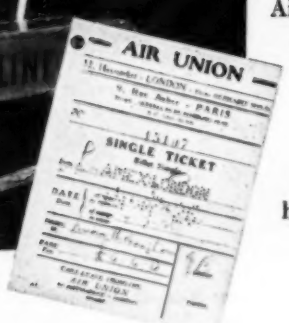
Then and Now . . .

A SATISFIED CUSTOMER FOR THIRTY YEARS



Mrs. Ridington's 1926 airline ticket.

Thirty years have brought radical changes in Air France equipment, but not in its reputation for dependability and comfort aloft.

Ask Mrs. Charles Ridington of Lansdale, Pa. In the picture above she is one of the group boarding a Farman "Goliath" in France prior to her flight to London. The date was July 4, 1926.

Now 30 years later, Mrs. Ridington will once again be an Air France passenger. This month she will be one of a group like those in the picture below boarding a giant Air France Super "G" Constellation enroute from New York to Paris.

Air France is proud of Mrs. Ridington's continued preference for its services. She is typical of those who have helped make Air France America's favorite European Airline.

OVER 4,000 PERSONS A DAY TRAVEL
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THE WORLD'S LARGEST AIRLINE
WITH 177,740 UNDUPLICATED ROUTE MILES

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PUERTO RICO • FORT DE FRANCE • POINTE A PITRE • PANAMA • CARACAS • BOGOTA

People

MANUFACTURING

Clare W. Harris appointed project engineer at Lockheed's Missile Systems Division; **Harry W. Kohl** named division engineer for the Missile Systems Division's new Bay area project division.

Raul H. Frye appointed gen. mgr. of Fairchild Camera and Instrument Corp.'s Electronics Division; **Maj. Gen. Kenneth P. McNaughton** (USAF, ret.) named director of corporation's west coast operations.

Brig. Gen. William L. Bayer (USA, ret.) elected exec. vp and gen. mgr. of Tele-Dynamics, Inc.

Paul Dollard elected president and gen. mgr. of Century Engineers Inc.

Louis S. Gearhart returned to United Aircraft Products, Inc. as director of publications.

Leigh Clayton appointed European area engineer for Logistics Research Inc.

Robert K. Johnson named sales mgr. for electronic components manufactured by Borg equipment division of the George W. Borg Corp.

T. B. Pritchard made financial director of Bristol Aircraft Limited; **G. E. Knight** named commercial director.

CLUTTER

John W. Clutter elected vp of Lockheed Aircraft Service, Inc.; also continues as gen. sales mgr.

Geoffrey W. Hall appointed managing director of the Fairey Aviation Co., Ltd., succeeding **Sir Richard Fairey,** resigned.

R. D. "Buck" Springer named sales mgr. for Tactair division, Aircraft Products Co.

RAdm. Robert G. Armstrong (USN, ret.) appointed liaison officer between Aircraft Owners and Pilots Assn. and various govt. agencies, including military departments.

O. H. Winn named mgr. of General Electric Co.'s Advanced Electronics Center, succeeding **Walter Hausz,** now on Defense Dept. assignment.

Wilson A. Gebhardt appointed section mgr. of aircraft products section of Bendix Products Division, Bendix Aviation Corp.

Brig. Gen. Harrison Shaler (USA, ret.) appointed corporate army advisor to Aerojet-General Corp.

Frederick W. Marquant elected chairman of the board and **Mrs. Hilda F. Niedelman,** vice chairman for Aviquipo, Inc.; **Richard U. Surbeck** elected president; **Fred J. Lazard, Jr.,** exec. vp and treas.

AIRLINE

John Stevens elected gen. counsel for Air Transport Assn., succeeding **Stuart G. Tipton,** now president.

Peter R. Easton appointed public relations mgr. for North America for Lufthansa German Airlines.

Daniel F. O'Donoghue elected asst. vp-overhaul for American Airlines' overhaul base at Tulsa.

P. H. (Pat) Cummings named asst. to the vp-sales for the Flying Tiger Line.

Larry Decker named regional sales mgr. for Bonanza Air Lines for Nevada.

R. M. Rummel advanced to administrative asst. in the sales-public relations administration of United Air Lines; **W. M. O'Hern** succeeds Rummel as director of publicity.

RUMMEL

O'HERN

Robert Booth appointed mgr. for Braniff International Airways in Republic of Panama; **W. H. Nelson** replaces **John C. Damhorst** as supervisor of tariffs for Braniff.

GOVERNMENT-MILITARY

Brig. Gen. Andrew J. Kinney appointed director of information services for Air Force, succeeding **Brig. Gen. Robert L. Scott, Jr.**

Col. Jack N. Stovall made chief of airlift division, Air Materiel Command Headquarters, Wright-Patterson AFB.

Capt. Iven C. Kincheloe, USAF, assigned as test pilot for the Bell X-2 rocket plane, replacing **Lt. Col. Frank K. Everest, Jr.,** who has been assigned to Armed Forces Staff College, Norfolk, Va.

Matthew H. Portz, formerly of Pentagon PIO staff joins NACA Lewis Laboratory as aeronautical information officer.

HONORS

Dr. Richard Filipowsky, of Westinghouse Electric Corp.'s electronics division, will receive British Institution of Radio Engineers' Heinrich Hertz Premium in recognition of his technical paper, "Electrical Pulse Communication Systems."

K. T. Keller received Navy's Distinguished Public Service Award in recognition of his service as Defense Dept. director of guided missiles.

Charles J. Cleary Award for 1955 goes to **David Roller,** ARDC, for perfecting an electrical resistance method for continuous measurement of corrosion rate of metals.

HONOR ROLL

(For 25 years' or more service in the industry)

W. M. Keasler, American Airlines. Pilot, flying operations, Ft. Worth.

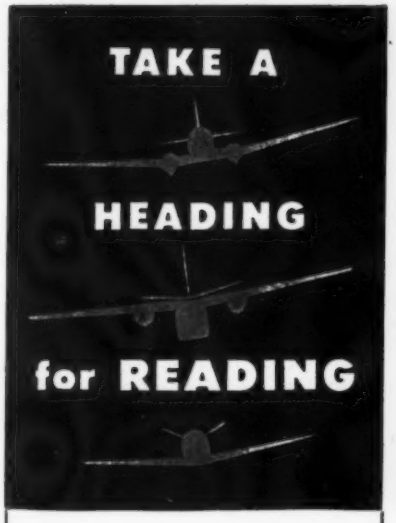
James M. Sipples, Pratt & Whitney Aircraft. Chauffeur for head office, E. Hartford, Conn.

Thomas D'Annolfo, Pratt & Whitney Aircraft. Foreman, mfg. materials sec., E. Hartford, Conn.

Adolph P. Olson, Pratt & Whitney Aircraft. Metal sprayer, E. Hartford.

Herman C. Helm, Pratt & Whitney Aircraft. Metal sprayer, E. Hartford.

Kenneth Bird, Pratt & Whitney Aircraft. Supt. of production test. E. Hartford, Conn.



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Circle No. 31 on Reader Service Card.

West Coast Talk . . . By Fred S. Hunter

● Why a windowless school was built in Mountain View, Calif.

THE KIDS in Mountain View, Calif. soon will be attending class in a new-type school building. No windows, insulated roof, extra soundproofing, heavier construction. This is because its location is in the traffic pattern of Moffett Field. The California Aeronautics Commision put its O.K. on this location in an area thick with jets, because it was about the only way out.

Hunter

Practically the entire community of Mountain View is in Moffett's traffic pattern. "It was our first compromise in 42 applications since the law became effective in June, 1955," said State Aeronautics Director Clyde Barnett. As part of the compromise the school district agreed to the windowless, sturdier construction despite the added cost.

The Navy cooperated, too. Raised the pattern from 1,300 to 1,600 feet and straight-in GCA from 1,600 to 2,300 feet. A lot of brickbats have been thrown at the state aeronautics commission in California from various sources, but few bouquets. So it's a pleasure to be able to give the commission a pat on the back for the firm policy it has pursued in administering the law on the location of new schools near airports. One compromise in 42 is a fine record. Particularly when that one compromise in itself is as good as this one.

• •

Douglas is so busy speeding up the production rate on new aircraft it can't keep up with orders for modification items, such as air ducts, hat racks, seat tracks, etc. ordered by airlines converting present DC-6Bs or DC-7s for high-density operation.

• •

New divisional setup at North American Aviation is much like that previously established at Lockheed. General policies are established at the corporate level, but otherwise division management is made relatively autonomous. It's up to each division general manager to see to it that his own operation pays its way. Lockheed divides into three divisions, California, Georgia and Missile Systems. North American breaks down into seven, Los Angeles, Columbus, Fresno, Autonetics, Rocketdyne, Missile Development and Atomics International.

• •

Eastern Air Lines is installing Curtiss-Wright's later model EA3 Turbo Compound engines in its 10 Model 1049G Super Constellations for greater engine durability and easier maintenance, not more power. Except for the .4375 reduction gear ratio, the EA3 is identical to the EA2 engine, which will power Lockheed's up-coming Model 1649A Super Stars and will develop 3,400 hp for takeoff and 2,800 METO. But EAL will be limited to DA power—3,250 hp for takeoff and 2,700 METO—by the propeller—Ham Standard's 43E60, which is the standard propeller for the DA3 normally used in the 1049G.

• •

If Pereira & Luckman, architects for the new Los Angeles International Airport terminal building, don't provide enough cocktail lounges and pick-up bars to keep passing travelers from becoming thirsty, it won't be Woody De Silva's fault. The superintendent of the L.A. airport is a practical man, and he's also very sharp on sources of airport revenues. Woody figures the booze concession will become bigger than ever if congress lowers the boom on hootch aloft on the airlines . . . And, speaking of Pereira & Luckman, this highly aviation-minded architectural firm is exploring the possibility of erecting an aviation building in Los Angeles, possibly in conjunction with the Institute of the Aeronautical Sciences, on land already held by that organization.

• •

Dave Callahan of Gilfillan is always handy with a good answer to any question. Recently he was on a television hookup when the announcer asked him if Gilfillan's radar equipment could have prevented the Grand Canyon collision that took place this summer. "Statistics," dead-panned Callahan into camera and mike, "show that twice as many people in the U.S. are killed every year by being kicked by mules than by riding on the scheduled airlines."

To the ENGINEER of high ability

Through the efforts of engineers The Garrett Corporation has become a leader in many outstanding aircraft component and system fields.

Among them are:

air-conditioning

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turbomachinery

The Garrett Corporation is also applying this engineering skill to the vitally important missile system fields, and has made important advances in prime engine development and in design of turbochargers and other industrial products.

Our engineers work on the very frontiers of present day scientific knowledge. We need your creative talents and offer you the opportunity to progress by making full use of your scientific ability. Positions are now open for aerodynamicists . . . mechanical engineers . . . mathematicians . . . specialists in engineering mechanics . . . electrical engineers . . . electronics engineers. For further information regarding opportunities in the Los Angeles, Phoenix and New York areas, write today, including a resumé of your education and experience. Address Mr. G. D. Bradley

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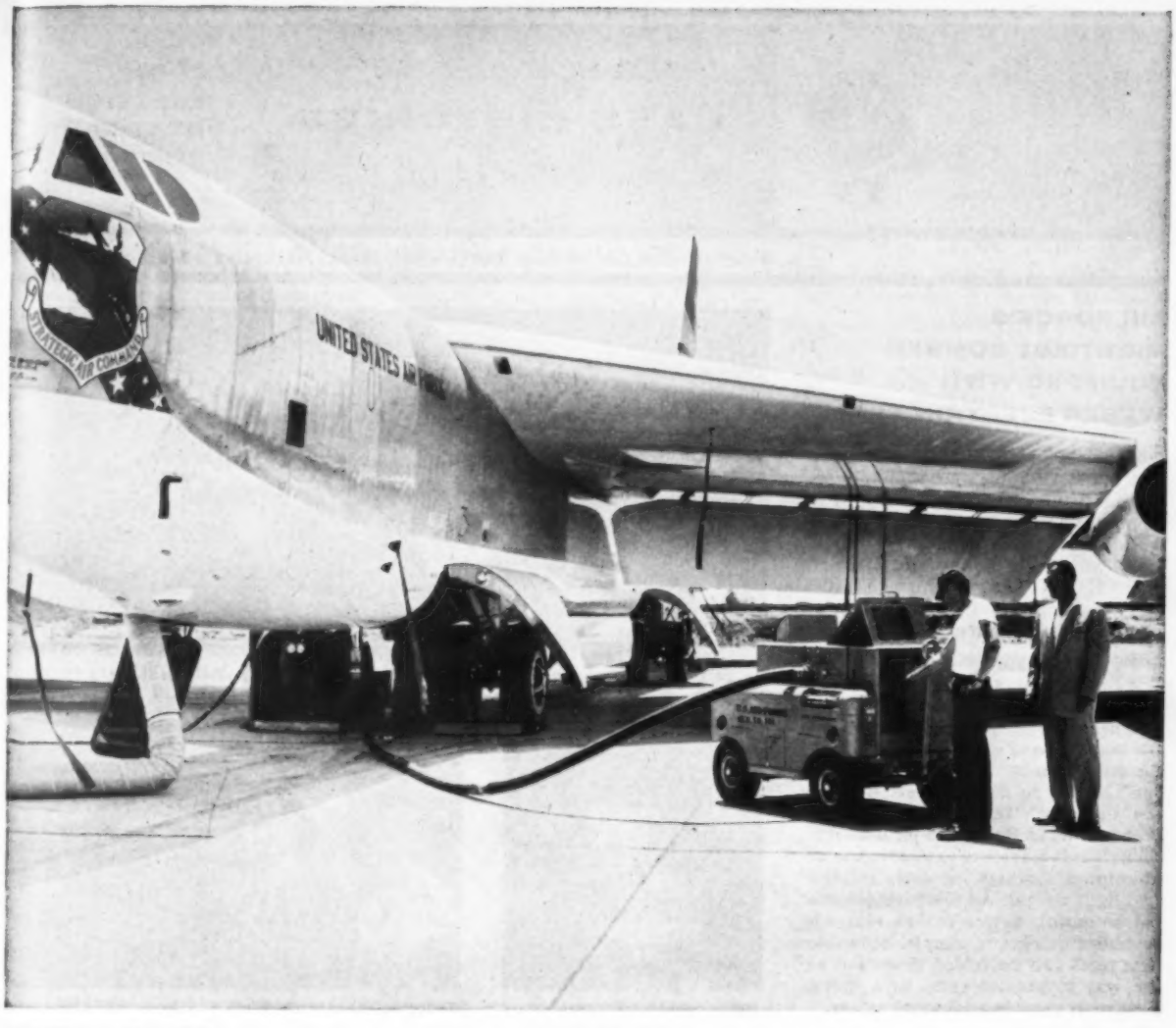

Mobile gas turbine power cart

takes only 30 seconds to start giant B-52 jet engines

The AiResearch MA-1A mobile gas turbine compressor, the first unit of its kind qualified by the Air Force to start the intercontinental B-52 bombers of the Strategic Air Command, is now in volume production at the AiResearch Manufacturing Division of Arizona.

Entirely self-contained, it furnishes a completely automatic source of compressed air power at the point of use. All components, parts and accessories are included in the fully-enclosed weather-proofed trailer.

The mobile unit weighs only 1150 pounds and may be controlled either from the instrument panel or from a remote control panel. It will start and maintain continuous operation at ambient temperatures ranging from −65°F to 130°F, together with the other extremes of environmental conditions encountered at airports throughout the world.

The two-stage gas turbine compressor may be removed easily from its trailer for use in other vehicles or as a stationary unit. It has an output capacity of 120 pounds per minute flow at 50 psia... enough power to meet all ground service needs for a modern airplane.

Write to our Sales Planning Department for further information on this product.

Qualified engineers are needed now. Write for information.

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Designers and manufacturers of aircraft systems and components: REFRIGERATION SYSTEMS • PNEUMATIC VALVES AND CONTROLS • TEMPERATURE CONTROLS CABIN A/C COMPRESSORS • TURBINE MOTORS • GAS TURBINE ENGINES • CABIN PRESSURE CONTROLS • HEAT TRANSFER EQUIPMENT • ELECTRO-MECHANICAL EQUIPMENT • ELECTRONIC COMPUTERS AND CONTROLS

Design, Development, Production

CASE HISTORIES

of Weber Aircraft Corporation

subject:
EJECTION SEATS FOR B-52

Weber Aircraft Corporation, 2820 Ontario Street, Burbank, California

AIR FORCE'S MIGHTIEST BOMBER EQUIPPED WITH WEBER EJECTION SEATS

Eight years in development, Boeing's B-52 is the Air Force's largest and fastest jet bomber, capable of flying a bomb load to the other side of the world and return. The giant, eight-jet, swept-wing aircraft, now in quantity production in Boeing plants at Seattle and Wichita, is equipped with Weber pilot, co-pilot and crew ejection seats.

Latest type ejection seats

The Stratofortress, designed to be the USAF Strategic Air Command's front line heavy bombardment aircraft, has the latest type of ejection seats so that the crew member has only to pull the "go" handle to find himself floating out in space. The seats, similar to Weber seats in Boeing's 6-jet B-47 medium bomber, feature extensive use of aluminum forgings for extra rigidity and light weight. An electro-mechanical actuating device makes seat adjustment quick and simple. Stowable arm rests can be folded down out of the way to provide extra arm space. Foot rests provide additional safety.

Static and functional tests

During the prototype phase, the seats were put through intensive static and functional tests at the Weber test facility and firing range. In production, they are the subject of meticulous quality control. Each seat is checked out under simulated ejection conditions before delivery. Every electrical and mechanical function is carefully tested on special stands.

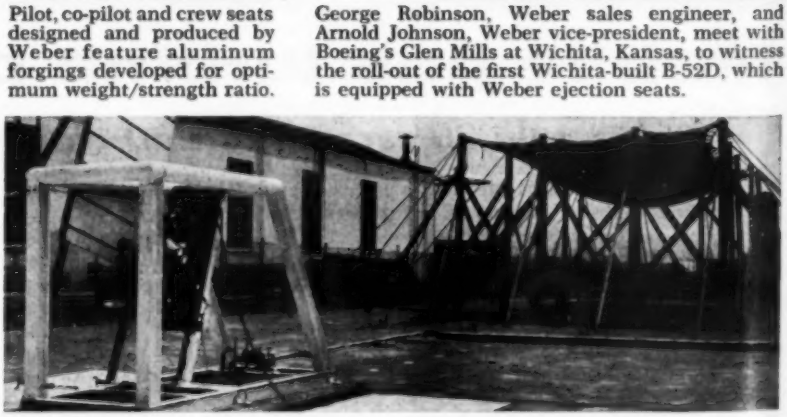
Weber participates in accelerated program

Weber is proud to be one of the manufacturers selected to participate in the accelerated B-52 program. Weber also manufactures the forward crew floor and nose assemblies as a sub-contractor to Boeing Wichita.

Eight Pratt & Whitney J57 jet engines develop approximately 100,000 pounds of thrust to propel the Boeing B-52 Stratofortress at more than 650 miles per hour.

Pilot, co-pilot and crew seats designed and produced by Weber feature aluminum forgings developed for optimum weight/strength ratio.

George Robinson, Weber sales engineer, and Arnold Johnson, Weber vice-president, meet with Boeing's Glen Mills at Wichita, Kansas, to witness the roll-out of the first Wichita-built B-52D, which is equipped with Weber ejection seats.



At the Weber test facility in Burbank, a B-52 ejection seat is subjected to instrumented operational tests, one phase of Weber's intensive test program.

Manufacturers of:
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Circle No. 33 on Reader Service Card.

Aerojet Sets Up Sales Network for Jato Units for Executive Aircraft

Aerojet General Corp. of Azusa, Calif. has set up a distribution network for executive aircraft sales of its 1,000-lb.-thrust Jato unit. The auxiliary power bottles now available are for multi-engine aircraft installation from the Beech D-18s series on up to DC-3s and DC-4s. Aerojet also is working on adaptation of the unit for single engine and smaller multi-engine business planes.

Already installed on several business aircraft, Jato is primarily a safety device to provide instantaneous auxiliary power of 1,000-lbs., equivalent to 400 hp, for 15 seconds, in event of partial or complete loss of the primary power. Specific applications for the rocket unit include availability of emergency power for:

- Increased thrust on takeoff at full load in hot, humid weather conditions.
- Single-engine failure on takeoff.
- Additional power in event of engine failure on final approach, particularly during an instrument landing, with bottles fired prior to wheels-up landing.
- Assistance in reaching high altitude under full-load conditions.

Average installation is expected to be two bottles per aircraft. Type of installation is dependent on type of aircraft. Internal or submerged installation, for example, will probably be found more suitable for the Lockheed PV-1 and external for the DC-3. The newly named distributors will have authorized dealer agencies for executing the installations.

Jato installation has been likened to having a spare engine. Pilot reports indicate that Jato acceleration is so great as to almost instantly restore any speed losses which occur. Only severe mishandling of the aircraft, it has been found, can result in dropping below engine-out control speed. No unusual flight characteristics have been reported from Jato use.

Pilot orientation is reportedly simple, with checkout brief. Under CAA requirements, however, the Jato bottles must be fired every 500 hours or once a year (whichever comes first) to insure pilot proficiency.

In a recent paper, an Aerojet executive reported: "With an engine out or 50% power, plus the thrust of two 1,000-pound-thrust rocket engines, a 30,000-pounds gross PV-1 accelerates from 110 to 150 mph in six seconds; a 27,000-pounds gross B-25 accelerates from 120 to 155 knots in five seconds; and a 26,900-pounds gross DC-3 accelerates from 97 to 115 mph.

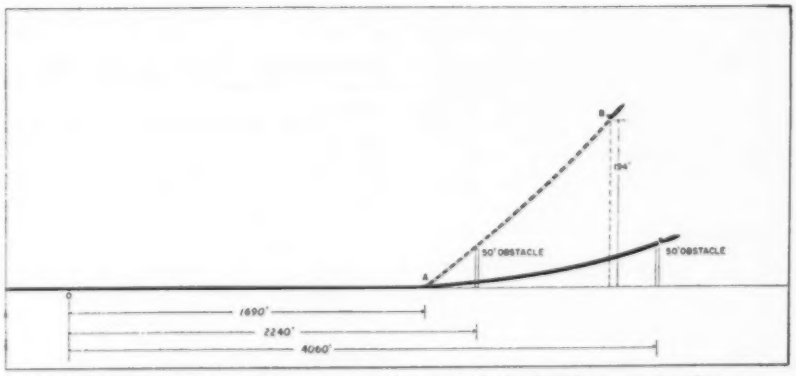
New distributor organization shapes up as follows: Aero Corp., Atlanta; AiResearch Aviation Service Co., Los Angeles; Dallas Aero Service, Dallas; General Aircraft Supply Corp., Detroit; Howard Aero, Inc., San Antonio; Lund Aviation, Inc., New York; Lund Aviation (Canada) Ltd., Quebec; Northwestern Aeronautical Co., St. Paul; Remmert-Werner, St. Louis, and Spartan Aircraft Co., Tulsa.

Meantime, based on its experience with Jato, Aerojet has proposed to CAA and CAB revisions of policy and regulation which would permit the following allowance for Jato-equipped aircraft:

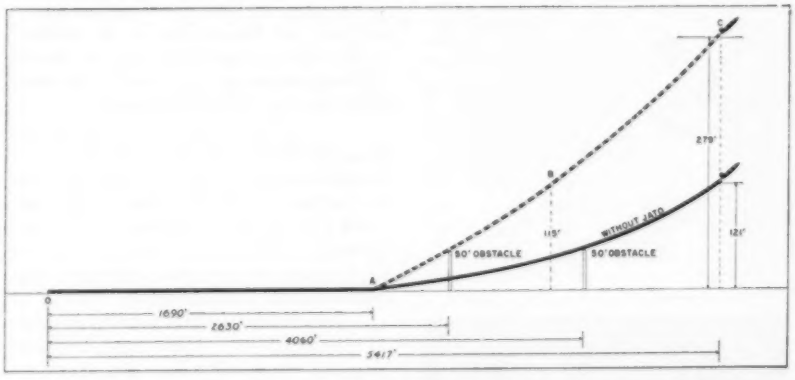
- Reduce runway length required, equal to 50% of the difference between the Jato engine-out takeoff distance and the engine-out takeoff distance in those cases where the use of the latter distance is required by the operating rules, except in no case shall the distance be less than the accelerate-stop distance.
- An increase in takeoff gross weight equal to the weight of the Jato and its installation, where such increase does not exceed the maximum allowable structural gross weight, or the engine-out enroute climb requirement, or 105% of the maximum allowable landing weight for those airplanes not equipped with fuel dump chutes, whichever is lowest; provided that the corresponding flight characteristics are satisfactory.

It is expected that such a proposal will be placed on the agenda of the annual airworthiness review, Aerojet, in the interim, has asked for the policy change by CAA prior to amending the regulations. ◆◆◆

Effect of Jato on Takeoff and Initial Climb Performance for the DC-3



Standard atmospheric conditions—sea level—no wind—hard surface runway. One engine fails and two Jatos are fired—Point A. End of Jato thrust—Point B. Gross weight—26,900 lbs.



Standard atmospheric conditions—sea level—no wind—hard surface runway. One engine fails and one Jato is fired—Point A. End of first Jato and firing second Jato—Point B. End of second Jato thrust—Point C. Gross weight—26,900 lbs.

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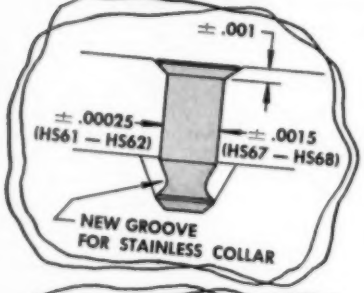

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Bonanza Conversion Makes Test Flight

A twin-engine conversion of the popular Beech Bonanza has been engineered and successfully test-flown in Tulsa. Evaluation tests are being conducted by David B. Peterson, chief pilot of Sinclair Oil. Application has been made for a CAA certificate and the modification will be offered on a commercial basis.

Peters, who also is an engineer and former Beechcraft employe, installed inverted 170-hp Lycoming engines on either wing of a Model 35 Bonanza with minor modification to the wing structure. In turn, he modified the engines to employ fuel injection instead of standard carburetion.

After removal of the 185-hp Continental engine, a new nose was installed with sufficient room in its cavity for 150-lbs. of baggage, radio and electronic equipment.

A cruise speed of 200 mph is expected, following more than 12 hours of flight test with a minimum controllable single-engine speed of 62 mph.

Business Flying Briefs

• **First demonstrations** of the new Tactair pneumatic three-axis automatic pilot have been scheduled for September, with the first 14 pre-production units to be completed in October. R. B. "Buck" Springer has been named sales manager for the autopilot by Tactair, division of Aircraft Products Co. of Bridgeport, Pa. Full production is expected in the first quarter of 1957.

• **Pacific Airmotive** has announced that it will begin flight demonstrations of the new Federal automatic pilot to fixed base operators and aircraft dealers shortly, to establish dealerships. PAC will visit all major cities in its territory in the West and Midwest. Two Cessna 182s have been equipped with the autopilot for the demonstrations.

• **A metal wing conversion** of the Ercoupe Model 415 has received a CAA Supplementary Type Certificate. The conversion has been designed by Skycraft Design of Langhorne, Pa. Company is doubling its present production of two sets of aluminum covered wings per week to four a week.

• **Firestone Tire & Rubber Co.** has announced a new nylon cord construction tire in all sizes for lightplanes, replacing the rayon line, at no increase in price. Two sizes—7.00-6 with 4-ply rating and 11.00-12 with 8-ply rating —are immediately available, with eight more to be marketed shortly.

• **July lightplane shipments** totaled 465, according to the AIA's Utility Airplane Council, of which 423 were four-to-10-place and 42 one-to-two-place. Total dollar value was $8,049,000 for the month. June figures were slightly higher, with 589 units shipped at a value of $9,093,000.

• **CAA has published** a revised listing of approved repair stations as of July 1, 1956, superseding the listing dated April 1, 1955.

• Lear Aircraft Engineering Div. of Santa Monica has announced CAA approval of the adaptation to Lodestars of its Learstar mechanical rudder spring tab system. It is said to eliminate rudder lock; reduce control pressures to permit use of full 1350 hp./eng. for takeoff and to facilitate maneuver control.

• A weather manual for private pilots, titled "Southland Weather Handbook," includes data on topography effect, weather origination, terminology, weather by months, smog, local weather signs and forecasting rules. It was written by John H. Aldrich, chief aviation forecaster in the U.S. weather center in Los Angeles, and Myra Meadows, a clerk in the same office.

International Aviation

By Anthony Vandyk

One of the most loyal customers of the U.S. aircraft industry in the commercial field is Brazil. Of the 267 aircraft flying with Brazilian airlines today, all but nine are U.S. models. Even the nine—Saab Scandias—built in Europe, have American engines.

Mainstay of the Brazilian airline industry is still the DC-3. No less than 175 are still performing excellent service and are likely to remain in operation for many, many years to come. REAL-Aerovias Brasil, alone, has 57.

• **An examination** of the composition of the fleets of the Brazilian airlines shows that modern aircraft are rare. Of the entire 267, only 29 are pressurized. These pressurized models are Panair do Brasil's eleven L-49 Constellations, Varig's three L-1049G Super Constellations and five Convair 240s, Cruzeiro do Sul's four Convair 340s and REAL-Aerovias Brasil's six Convair 340s.

Because the Brazilian airlines are so loyal to the U.S. aircraft industry and so badly in need of new, modern equipment, the recent remarks of Ruben Berta, president of Varig, to the Export Committee of the Aircraft Industries Association in New York are of particular interest. He forecast that if there is not an easing of credit terms for the purchase of U.S. aircraft, South America will be more deeply penetrated by European aircraft manufacturers.

• **Berta acknowledged** that certain U.S. banks and the Export-Import Bank have helped certain Latin-American carriers considerably, but there is still much to be done. Berta made the significant point that by concentrating their entire resources—both cash and credit—South American airlines obtaining financial assistance from the U.S. are able to purchase only about half of the aircraft they need. His inference was that European manufacturers can provide facilities for Latin-American airlines to get *all* the aircraft they require.

The question of keeping aircraft flying is just as important as initial acquisition. In Brazil, a battle has to be waged with the government's Banco do Brasil for spares manufactured abroad. It takes weeks, if not months, for applications to be processed, and the end result is almost inevitably refusal or a reduction of the funds requested. As a result, many airlines in Brazil have to keep their aircraft grounded for lack of spares and are thus unable to operate as efficiently as they could if they were fully stocked. "Cannibalization" of aircraft is also common, to keep the fleet flying.

Fiat Fighter Undergoes Flight Tests

Fiat G.91 U.S.-sponsored lightweight fighter is now undergoing flight tests. It is powered by a Bristol Orpheus turbojet. Italian company has contracts to build 30.

British Declassify Screamer Rocket

Transfer of Armstrong Siddeley Screamer rocket engine to "Open" Security classification, with consequent release of data and performance, indicates the United Kingdom has abandoned liquid oxygen as an oxidant in favor of hydrogen peroxide—as used in de Havilland rocket motors.

Nevertheless, the Screamer represents the ultimate in an intensive Armstrong Siddeley government-sponsored development program. The rating of the Screamer could be indicative of the power of the still classified DH Spectre.

The Screamer is a compactly-grouped motor 78 inches long, 28 inches in diameter and weighing 470 lbs. Fuel is aviation kerosene with LOX as oxidant. Initially rated at 4,000 lbs., the current model delivers 9,500 lbs. thrust at 40,000 ft.

Armstrong Siddeley flew its first rocket motor, the 2,000-lb.-thrust Snarler, in a Sea Hawk in 1950 and has for three years exhibited a working model of a controllable thrust rocket system at air shows. The Screamer probably is a throttleable powerplant.

KLM to Offer Stocks for Sale

The company structure of KLM Royal Dutch Airlines has been streamlined and the carrier is now able to offer its shares on the world's stock markets. Amendments to the company's by-laws shift administrative functions of the airline from the present eight-member Board of Management to a management group with at least three members.

Other changes involve abolition of existing "A" priority shares, owned by the Dutch government, and for the general exchange of cumulative preference shares and founders' shares for common stock. Remaining are one type of priority shares and one type of common stock, with the Dutch government holding a majority.

The new shares have a par value of 100 Guilders, which is hoped to be conducive to spreading the ownership of the shares, in part among small investors. The intention is to issue the shares to the public in due course.

An amendment to KLM's statutes also permits the company to make purchases of its own shares, with a certain first purchase from the Netherlands state of a block with a par value of 15 million Guilders issued in 1950 on the occasion of KLM's financial participation in Garuda Indonesian Airways, a fund returned by Indonesia. The airlines' new management group is now under the supervision of a new board of directors, with at least seven members, which replaces the former Board of Directors and the Board of Management.

MILITARY BRIEF

The Royal Air Force has decided to adopt the Hunting Percival Jet Provost 2 as a basic jet trainer. It will probably order about 200 of the Armstrong Siddeley Viper-powered aircraft.

Filter Tests Show Important Savings

1,200-hour flight tests of Winslow filters on R-4360 engines by Pan American World Airways indicate savings of hundreds of dollars per engine, for replacement parts and labor.

During the tests, at 901:46 T.S.O., a piston failed in a filter-equipped engine. Because the Winslow CP* full-flow filter picked up the metal particles, cost of repairs was only $315.39—the average cost for piston failure on eight other engines was $1,935 per engine.

Winslow has CAA-approved full-flow filters for most aircraft engines. For engineering data and recommendations for your equipment, please write: Aviation Department, Winslow Aerofilter Corporation, a Division of Winslow Engineering and Manufacturing Co., 4069 Hollis St., Oakland 8, California.

CP* (Controlled Pressure) is fully protected by patents and trademarks.

AV-56-1

WINSLOW FILTERS

Circle No. 24 on Reader Service Card.

CAA Tightens Rules For Pilot Flight Tests

Increasing number of accidents and critcial incidents in the operation of light multi-engine aircraft has brought about a change in CAA policy on pilot flight test qualifications.

Aviation Safety Release No. 405, issued recently by CAA, orders that all future tests be conducted only by agents and examiners who are qualified in the particular aircraft being flown.

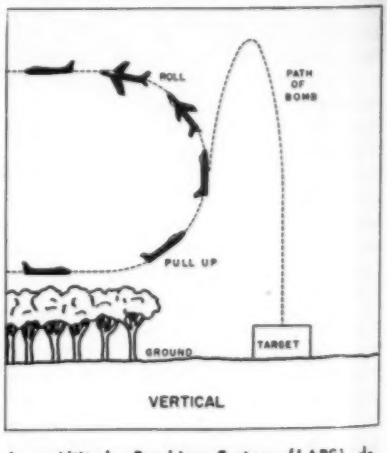
To make the policy practicable, CAA has also launched an extensive training program to check out about 150 agents in such planes as the Aero Commander, Cessna 310, Beech Twin Bonanza, Piper Apache and Riley Twin Navion.

Contracts have been let for rental of a Bonanza and Apache, and four groups of agents have been processed through CAA's Oklahoma City training center. Similar arrangements are being worked out on the other three types.

McCallister Wins Ricks

Winner of the 1956 Ricks Memorial Trophy is Maj. David F. McCallister of the 142nd Air National Guard fighter-interceptor squadron, who flew the 1,922-mile course from Hamilton AFB, Calif. to Moisant International Airport, New Orleans in 3 hrs., 30 mins. and 8 secs. McCallister piloted an F-86 and averaged almost 548 mph.

Outwitting Radar



Low Altitude Bombing System (LABS) developed by Minneapolis-Honeywell Regulator Co.'s Aeronautical Division enables fighter and fighter-bombers to make sneak attacks below radar detection level. Plane has electronic LABS equipment for guidance and timing. Maneuver is believed to be automatically executed and to use new 360-degree spherical gyro "platform" that carries plane through Immelman turn automatically, because of high g forces (7-10) inflicted on pilot. Time for up and down trajectory leaves time to escape.

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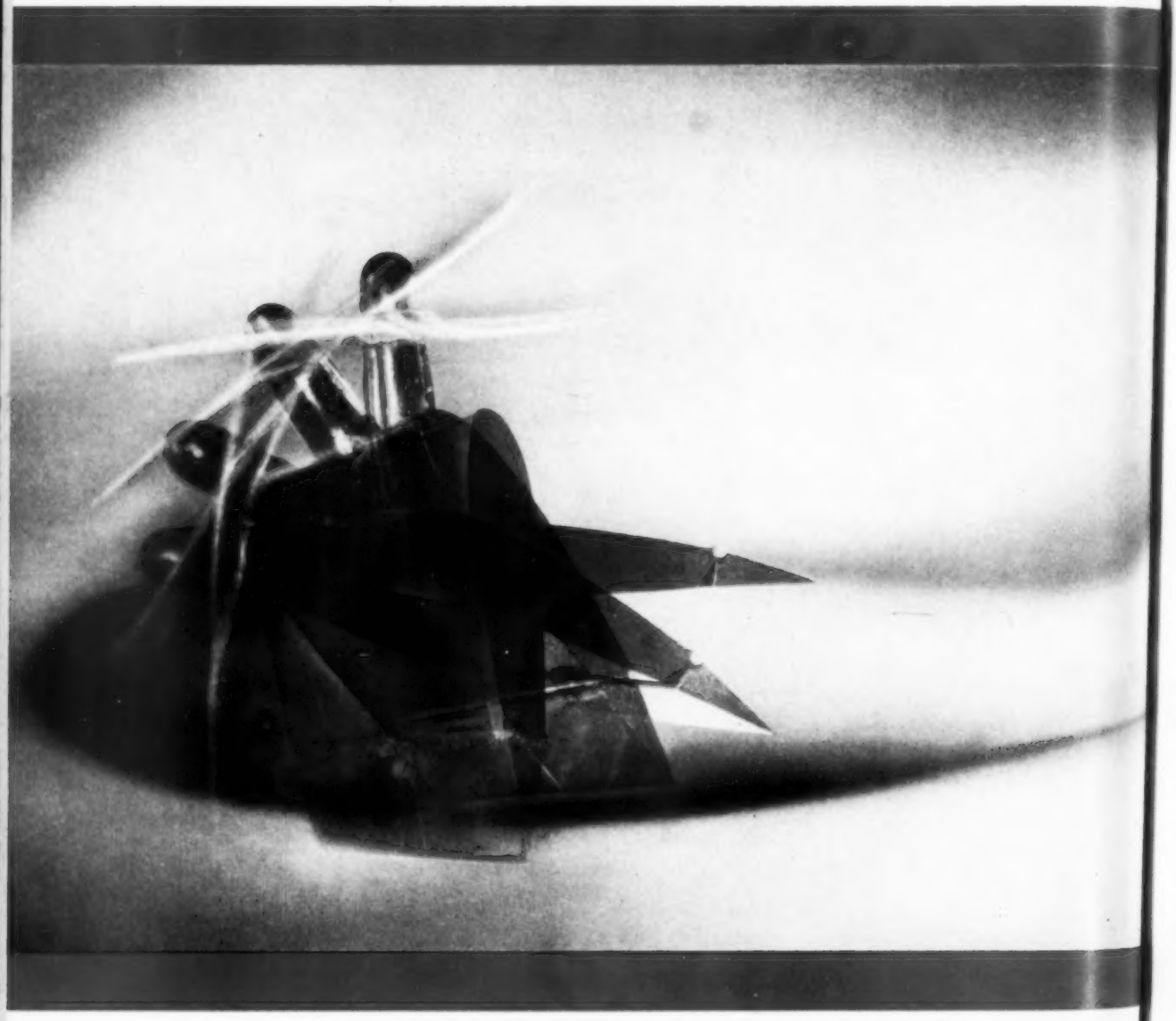
Wings of old take on a new turn to bring true VTOL flight closer. Vertol research now takes on one of the most advanced assignments of the decade—high speed aircraft with vertical takeoff and landing capability.

Project: Vertol is now developing aircraft types which will fly as fast, as high, as far, as today's transports yet are able to take off and land at 0 mph forward speed.

Qualifications: Vertol's long-established leadership in the helicopter industry, Vertol's impressive research and development record in all aspects of vertical flight.



Progress: Vertol is currently developing a flying test bed for the Army under contract with the Office of Naval Research. In this aircraft—a small-scale variant of the larger, more powerful production types to come—a gas turbine drives rotor propellers housed in the wings of the aircraft. To takeoff and land vertically, both wings and rotor propellers pivot straight up; the rotor propellers furnish the necessary lift. At altitude, the wings tilt over into "normal" horizontal position, as the aircraft gathers flying speed; cruise is conventional and fast.

To give tomorrow's planes the universal landing and takeoff characteristics of today's helicopters is the essence of the Vertol "Skyways without Runways" concept.

VERTOL Aircraft Corporation

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MORTON, PENNSYLVANIA

TRANSPORT TRENDS

Washington, D. C., Sept. 10, 1956

AIRLINES WILL NEED ALMOST NINE MONTHS to prepare for hearings in CAB's general passenger fare investigation. Even though issues are "limited" to fare levels and earnings, they are broad in scope. Industry's entire financial picture—past, present and future—will be covered. Most optimistic estimate for final CAB decision is early 1958.

●

SAFETY MAY BE KEY to CAB decision on its proposed rule to bind airlines to 75% on-time factor in scheduling. If CAB adopts the rule, it will be over objections of CAA safety chief W. B. Davis. Proposal would undoubtedly benefit the public somewhat by having schedules reflect actual departure and arrival times, he concedes. But he questions whether it wouldn't indirectly affect safety standards by exerting undue pressure on operations and maintenance personnel to keep flights on time. CAB oral argument on the rule starts Sept. 27.

●

BIGGEST BOTTLENECK so far encountered in the long-range aviation facilities study at the White House is lack of accurate and sufficient information on general aviation. Diversification of interests in this field is apparently the reason. The General Aviation Facilities Planning Group, formed earlier this summer to supply data, appears to be moving slowly. Action is needed if general aviation is to get the attention it needs in the planning of special Presidential aide Edward P. Curtis.

●

NORTHEAST AIRLINES PLANS TO OPEN its new east coast route in December. Initial service will be to Washington and Miami. Other cities will receive schedules as tight equipment situation eases. Deliveries on NEA's 10 DC-6Bs are slated to begin next February. Company hopes to lease similar planes to get in on Miami winter season business as early as possible. NEA is eyeing the Bristol Britannia turboprop for possible late 1957 service. It's uncommitted for jets at this point.

●

ATA HAS MAPPED ITS COURSE on anti-collision development at committee level. Next step: approval by board of directors. Program will be in two phases—(1) a low-cost "interim" device for early installation and (2) a "permanent" anti-collision system still requiring extensive development.

●

NON-SKED COMPETITION MAY AGAIN PLAGUE certificated Alaskan airlines. Unlimited non-sked flying virtually crippled these carriers several years ago. CAB now has a report that non-skeds are again moving into the Territory and securing entrenched positions through military contract services. Some are doing so through aircraft leasing arrangements.

But one company—Air Cargo Express—is operating in its own name, says an Alaskan airline official. Reportedly "operating through" this company is Amos Heacock, one-time head of Air Transport Associates and leading non-sked spokesman some years ago. ATA's license was revoked for violations of the Civil Aeronautics Act.

This needle-nosed, stub-winged Lockheed F-104A Jet packs more punch per pound than any fighter ever built. Its Honeywell Transistorized Fuel Gage System weighs only 2-1/2 pounds complete with indicator-amplifier unit and two tank units. Despite its low power requirements this new gage is accurate to within 2% with any fuel load. Sub-miniaturized fuel measurement systems are another example of the way in which Honeywell Aero anticipates the instrumentation needs of modern jet aircraft.

AERONAUTICAL DIVISION, MINNEAPOLIS-HONEYWELL

Is CAB Moving to Short-Circuit IATA?

It may not be . . . but efforts to gain cooperation of foreign governments in international rate-making show which way wind is blowing.

By WILLIAM V. HENZEY

CIVIL AERONAUTICS BOARD has moved to vacate the isolated post among world aviation bodies that it assumes consistently with respect to international air fares.

In an order late last month reluctantly approving for one year the new fare program adopted by the International Air Transport Association at Cannes, France, CAB issued a call to foreign governments to meet with it in exploring "fundamental policies" of international rate-making.

Of immediate import is the fact that CAB's approval action averts a rate war which threatened to engulf transatlantic air operations this fall. But of broader significance is whether CAB will realize success in establishing a world-wide governmental policy group and whether such a group would short-circuit IATA's rate-making machinery.

• **Behind both** immediate and long-range aspects of the Board action is a smoldering situation in which CAB's insistent cries for fare cuts have run head-on into European charges of "unilateral dictatorship" by CAB.

The situation became public early this year when CAB was forced, by pressure of foreign governments, to reverse an order which would have prohibited an April 1 increase in certain first-class fares. In agreeing to reverse its position, CAB ordered IATA carriers to reduce basic tourist fares by October 1, or suffer the consequences —even an "open rate" situation.

Bitter Verbal War

Fuel was added to the fire by subsequent events in the U.S. Congress which produced a bitter verbal war between CAB and IATA. Theme of the dispute was whether IATA was a "monopolistic price-fixing cartel" as some U.S. officials chose to call it.

IATA's reaction to the name-calling was perhaps most forcefully expressed by IATA Director General Sir William Hildred, who told a Congressional committee that "only an imbecile or a lunatic" would refer to IATA as a cartel.

Against this unpleasant background, IATA traffic experts met in Cannes in late May to work out a fare program as called for by CAB.

• **Basic changes** in fares were agreed upon but the timing of such changes was not in line with CAB's directives. Instead of an over-all reduction in tourist fares this fall, IATA agreed to implement a 15-day round-trip tourist excursion fare which would mean an approximate $100 saving for short-term transatlantic travelers.

Adjustments in basic first-class fares, which CAB urged should be made this fall, will not take place until April 1, 1957. Reductions in basic tourist fares, instead of this fall, will become effective April 1, 1958.

As is required, the fare program was submitted to CAB in the form of IATA resolutions or agreements. CAB could approve and permit IATA to implement its fare adjustments in an orderly, though lengthy, manner, or it could disapprove and permit an open-rate situation as it threatened earlier in the year.

• **CAB reluctantly approved** but reiterated its position that tourist fares could be reduced now by approximately 10% without any reduction in airlines earnings.

CAB's call to foreign governments, however, suggests reconsideration of the entire matter prior to April 1, 1957, meaning that the first phase of the IATA fare program will become effective as planned this fall but other phases, those slated for effectiveness in 1957 and 1958, must run the gauntlet of further CAB action.

CAB Attitude Clarified

The Board's handling of the situation indicates the agency is aware of foreign governments' opposition to its powerful role and now seeks to elevate those governments to its stature rather than join in recognizing IATA machinery as the ultimate in international rate-making authority.

• **Here is how** the U.S. agency expressed it: "The Board is seriously concerned with the apparent feeling on the part of the European countries that

Lockheed 1649A Gets A Name

Lockheed's newest transport the 1649A has been named Super Star Constellation. New transport, first of which is scheduled to fly early this fall, has a new wing with 27 ft. greater span and one-sixth thinner than previous Connies. Super Star will carry 33 luxury siesta passengers or up to 80 in tourist configuration. Cruise speed is 350 mph, range 6,400 mi. Aircraft is powered by four Wright Turbo Compound engines.

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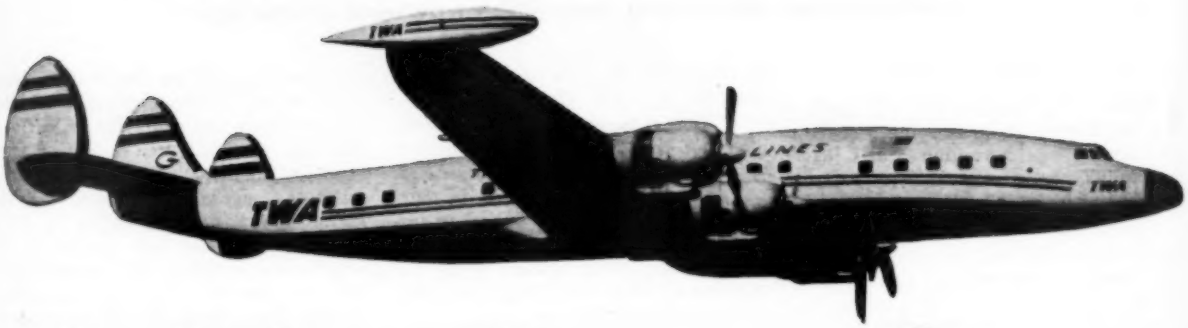
TWA offers new



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it is attempting to dictate unilaterally the specific action to be taken by the IATA rate conferences in the area of North Atlantic fares.

"The Board has, in the past, and continues to support the IATA machinery as the most desirable means of dealing with the complex problems involved in developing the international rate structure, and recognizes that, to a very large extent, the carriers should be free to determine among themselves the particulars of the program which is to be followed.

"However, the Board also continues the view that the ultimate determination of the objectives to be achieved and the broad policy framework which should govern the development of this rate structure is not solely a function of the carriers concerned, operating through IATA.

"These broad considerations transcend the interest of any one carrier or group of carriers and, in the Board's opinion, are properly matters which must ultimately be agreed upon by the various governments involved in the light of their respective statutory and other responsibilities."

It should be pointed out that CAB's use of the term "rate structure" in the above statement refers to the detailed results of a higher decision on "rate levels." Thus, the Board recognizes IATA as the competent body to carry out the details but recommends a top governmental body to call the shots on the important matter of rate levels.

In urging early meetings with foreign governments on this problem, CAB is actually putting in reverse the procedure which has worked against it several times this year. For example, when CAB reversed itself in February on the first-class fare issue, it was the result of foreign government opposition conveyed to CAB through our State Department.

Also, when the matter of the new IATA fare program was before CAB this summer, the voices of foreign governments were echoed through our State Department and called for approval. Significantly, the CAB staff was violently opposed to Board approval of the program.

Thus, as CAB now moves for foreign governments' cooperation, it is doing so through the State Department. No high-powered meeting of all governments concerned is anticipated. Instead, CAB and State officials are expected to meet with each foreign government separately.

It is too early for specific reaction from across the Atlantic but an early insight may be in this cabled message from one of AMERICAN AVIATION'S European correspondents: "European civil aviation circles generally opposed to CAB proposal to reconsider Cannes agreements (of IATA) either in bilateral or multi-lateral intergovernmental discussions." ◈ ◈ ◈

How Good is Britannia? U.S. Is Impressed

By ANTHONY VANDYK

The Bristol Britannia was the No. 1 talking point of the U.S. air transport industry—and many elements of the aircraft industry—last month as a result of a highly successful demonstration tour of North America.

Masterminded and personally conducted by Peter G. Masefield, head of Bristol Aircraft Ltd., the tour represented the first real attempt to apply U.S.-type merchandising methods to a British aircraft. Traditionally British modesty went by the boards and the Britannia was labelled by its manufacturer as "the world's largest, fastest, quietest and most economical aircraft."

After riding in the aircraft and listening to Masefield's U.S.-tailored sales pitch, many high airline officials were giving the Britannia a new appraisal.

Previously regarded as something segment of the industry as something of a white elephant, the big turboprop transport ended its North American tour amid high praise from all who had been exposed to it. The two advantages of the Britannia which most surprised U.S. observers were its quietness and its availability.

Astonishingly Quiet

Living up to its billing as "The Whispering Giant," the Britannia surprised North America with its low noise level, both internal and external. Many of those who rode in the aircraft rated it quieter than the Viscount in most parts of the cabin. Ground observers who listened to the Britannia take off agreed that it was no noisier than a DC-3. The reason for the low noise level is that the De Havilland hollow-steel propellers driven by the Proteus engines turn at unusually low rpm (less than 1,000).

The availability of the Britannia came as almost as big a surprise to many U.S. observers as the aircraft's quietness. Although not yet in scheduled service with BOAC, the Britannia is already in quantity production: 12 have come off the line to date. It is being built by Bristol at Filton and by Short Bros. and Harland at Belfast. Soon the two plants will be turning out an aircraft every two weeks. This high rate of production is based on optimism that the present orders for 55 Britannias will be substantially increased.

Bristol has arranged its production schedule so that seven aircraft are available for delivery in 1957—two in June and five between October and December.

No other manufacturer of large transports has aircraft up its sleeve in this manner. Consequently the Britannia is generating real interest among those operators who have been late in getting into the turbine era. Bristol also has aircraft available for delivery between April and December 1958.

• **List price** of the Britannia 310 is $3,500,000 (exclusive of radio and other buyer-furnished equipment). The Proteus engine is tagged at $106,400 (bare) while Proteus powerplant equipment sells for $70,420 per powerplant. The price of the De Havilland propellers for the Britannia is $84,000 per aircraft set.

While the Britannia 310 is the standard long-range version of the aircraft, Bristol is also offering a medium-range development, the 320 series. Available early in 1958 and with a guaranteed cruising speed of 400 mph,

The first stretched-fuselage Bristol Britannia made its maiden flight on July 31. This aircraft, the Britannia 301, is the prototype of the 300 and 310 series and will be used for certification tests for these versions. They all have a fuselage of 124 ft. 3 in., 10 ft. 3 in. longer than the Britannia 100's.

Actual test firing of a modern ROCKETDYNE rocket engine at the Field Test Laboratory in the Santa Susana Mountains.

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For the past 10 years ROCKETDYNE has been working closely with the Department of Defense, producing its rocket engines as required, and delivering them on time. New and more powerful rocket engine designs for tomorrow's more effective missiles are in constant development.

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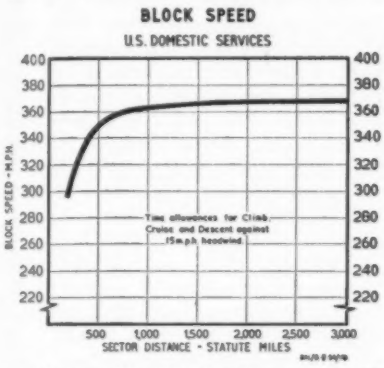
ROCKETDYNE

A Division of North American Aviation, Inc.

BUILDERS OF POWER FOR OUTER SPACE

the Britannia 320, according to Bristol, "is substantially more economic to operate than any competitive airliner over sector distances ranging from 200 up to 2,600 statute miles." Over these stages it can carry a maximum payload of 28,000 lbs. including up to 133 passengers.

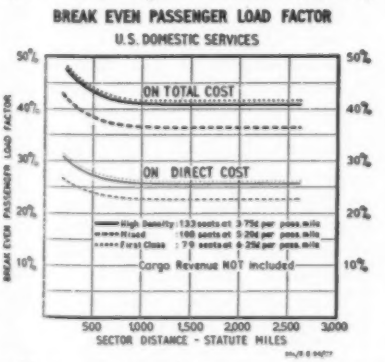
The Britannia 310 differs from the 310 series in two main respects. It has revised windows giving a wider field of view, without any effect on stress levels



and fatigue life. The landing gear is of a new design to give additional emergency lowering facilities and greater strength, permitting lowering at higher air speeds.

• **The next step** in the Britannia development program will be the 400 series, which will be available in 1960. This will be similar to the 320 in design but will be powered by the BE 25 Orion instead of the Proteus. This engine will give the Britannia a cruising speed of about 440 mph with consequent reduction in seat-mile operating costs.

After the Britannia 400 will come the 500 series, to be available in 1961, which will incorporate structural strengthening to take full advantage of the Orion's power. In particular it will enable the aircraft to be flown at the high speeds and low altitudes desirable for short-haul operations. The structure will permit a cruising equivalent air speed of 350 mph at 20,000 ft., giving



a Mach number of 0.65 or a true air speed of 450 mph.

Improved soundproofing will be installed to allow for the use of higher powers taken from the Orion for operation at lower altitudes. The landing gear will be strengthened to allow lowering at high speeds, thus permitting its use as an airbrake for fast descents.

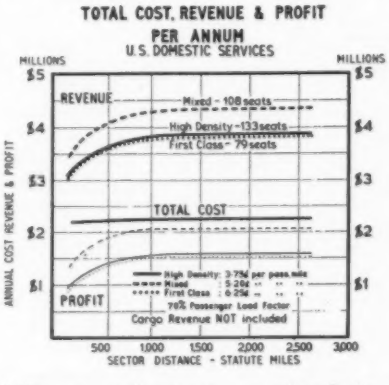
Cruises at 460 MPH

Bristol says that for a stage of 575 miles the Britannia 500 will cruise at 460 mph and have a block speed of 431 mph.

Taking off at 140,000 lbs. gross, it will require a field length of 3,610 ft., or 4,760 ft. at 160,000 lbs.

This big development program for the Britannia is based on Masefield's conviction that up to 1962 the turboprop will predominate and that thereafter the jet and the turboprop will live side by side for a long time. He believes that the turboprop "will remain with us in its advanced form for as far forward as we can see."

• **Masefield cites** three reasons for this belief. Firstly, "the turboprop remains significantly the most economic means of carrying passengers by air." Secondly, "turboprop models will be increased to better than 500 mph." And thirdly, "the turboprop has more flexi-



bility on performance—on takeoff distance, on operating height, and the sector length—than the jet; it presents no new air traffic control problem." So with these attributes and low-fare coach traffic becoming increasingly important, Masefield believes that the turboprop is here to stay. ◆◆◆

SEC Investigating NEA Stock Activity

Securities & Exchange Commission is conducting an investigation of activity in Northeast Airlines stock immediately following a Civil Aeronautics Board decision to extend NEA's route from New York to Miami.

NEA stock increased $3.50 per share and volume increased substantially subsequent to the Board vote but prior to public announcement of the decision.

SEC's primary interest is in possible manipulation of the stock. CAB formally requested the investigation, however, and the Board's main concern is with the possibility of a "leak" by one of its personnel.

Political Party Planks on Aviation Show Sharp Differences

Aviation planks of the 1956 platforms of the nation's two major political parties stress safety and reflect a tug-of-war between scheduled and non-scheduled airline interests over the so-called "freedom of entry" philosophy.

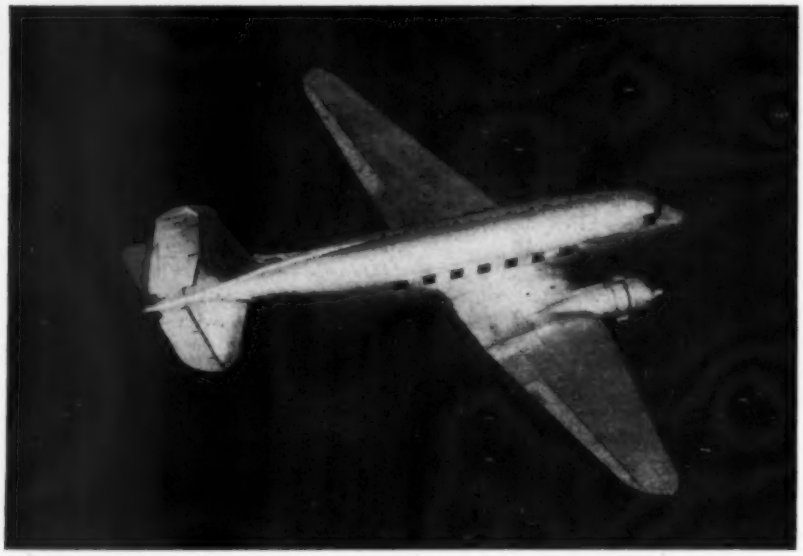
Democrats, with non-scheduled airline supporters Rep. Emanuel Celler (D-N.Y.) and Sen. Joseph C. O'Mahoney (D-Wyo.) leading the way, granted specific recognition to "new licensees." No such recognition is apparent in the Republican's platform. Following are the respective aviation planks of the two:

• **Democrats:** "The public and national defense interest require the development and maintenance, under the competitive free enterprise system, of a strong, efficient and financially sound system of common carrier transportation by water, highway, rail and air, with each mode through sound and intelligent exercise of regulatory powers, enabled to realize its inherent economic advantages and to reflect its full competitive capabilities. Public interest also requires, under reasonable standards, the admission of new licensees into the transport field. We deplore the lack of enforcement of safety regulations for protection of life and property under the present Republican Administration and, instead, pledge their strict enforcement."

• **Republicans:** "To meet the immense demands of our expanding economy, we have initiated the largest highway, air and maritime programs in history, each soundly financed. We shall continue to advocate the maintenance and expansion of a strong, efficient, privately-owned and operated and soundly financed system of transportation that will serve all of the needs of our nation under Federal regulatory policies that will enable each carrier to realize its inherent economic advantages and its full competitive capabilities.

"We recognize the United States' world leadership in aviation, and we shall continue to encourage its technical development and vigorous expansion. Our goal is to support and sponsor air services and to make available to our citizens the safest and most comprehensive air transportation.

"We favor adequate funds and expeditious action in improving air safety, and highest efficiency in the control of air traffic."



New, more efficient airfoil has been created by modifying the old DC-3's ailerons and substituting a continuous fillet near the wing butt area instead of the former slotted, drag-producing structure.

Old DC-3s Never Die—Someone Always Pumps New Life into Old Workhorse

DETROIT—While the 20-year-old DC-3 may be growing old gracefully, its aging process is being continuously slowed down by new forms of face-lifting. The old workhorse, rather than being put out to pasture, keeps getting new injections in its airframe and engines in a constant go-round of rejuvenation.

Forestalling its demise is a matter of necessity rather than choice. Despite its high-subsidy character, the DC-3 will be the mainstay of local service airlines for some years to come because of the inherent problems in financing more modern and more expensive equipment. For want of new production on a comparable aircraft, the business aircraft user is still dependent on the DC-3 for a medium-size transport.

• **The industry** has been trying to bridge the gap between the DC-3 and its replacement by keeping the old gray mare of the air not only flying, but better equipped for modern transport needs.

The answer so far has been conversion. About two years ago, Pan American World Airways came out with its Hi-Per DC-3, which features P&W R-2000 engines and a new burst of speed from its plodding 180 mph to about 214 mph. Remmert-Werner of St. Louis created the Super DC-3 with souped-up R-1830 engines that gave it some extra push and advantages. Others have been marketed and others are being engineered.

Latest to challenge the seemingly unquenchable sellers' market for a modernized DC-3 is a Detroit firm with The Challenger 250. Granted a CAA supplemental-type certificate several weeks ago, the modification was engineered by James Hurst, former Pan American pilot and executive, with Roscoe Turner as consultant.

Aerodynamic structural changes, along with installation of P&W R-1830-94 or R-2000 engines, have been accompanied by claims of new high in speeds ranging from 225 to 240 mph.

• **Financial backers** first incorporated a firm in Panama to carry on the engineering work. Then, about a year ago, they launched Aircraft Conversion Corp. in Detroit to carry out the production, as well as CAA-designated engineering procedures in the locale.

First scheduled carrier to put its DC-3 through this company's "fountain of youth" is CMA, the Mexican Airlines, which has the first of its 17 DC-3s on the line in Detroit. Hurst, who serves as executive vice president, estimates that design changes and engine installation can be accomplished in just about two weeks at a cost of $30,000. Modification in addition to engine change includes:

• Redesigned oil-cooler fairing and landing-gear-wheel well doors eliminates drag, the company states, by providing covered wheel well and one symmetrical line. Gear retraction is accomplished by a single tube with direct linkage to the drag strut.

• Airflow over the wing butt has been changed through installation of an unbroken fillet in the area which is believed to provide a constant parallel air stream flow about the fuselage, resulting in greater stability.

• Aileron has been redesigned to create more efficient airflow, it is claimed, and to provide complete aileron control in stalls.

Performance claims for the modification include:

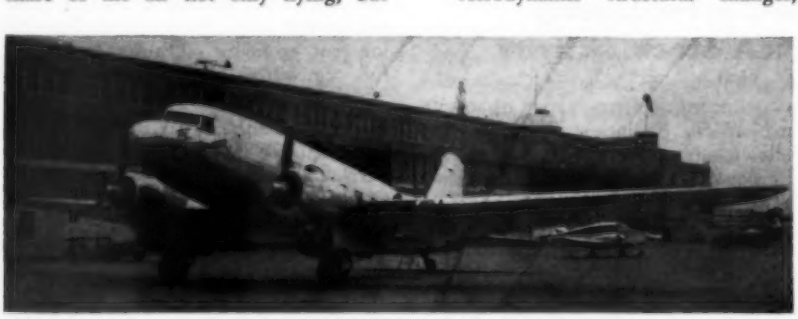
• More directional stability through application of "the area rule principle" to the aircraft, with pilots reporting no discomfort while pulling 3Gs at speeds up to 200 mph.

• CAA reportedly found "measurable improvement" in all stability over the standard DC-3, with better aileron control maintained throughout stalls.

• Landing speeds have been reduced 5 mph with the modification coming over the fence at about 74 mph.

All components are designed, it is pointed out, so that at maximum weights up to 26,900 lbs. no danger will result from excessive gust loads often encountered by inadvertent overspeeding. Based on prototype tests, the modification also is expected to have improved short-field characteristics. At full payload, the Challenger has been designed to take off from or land in 2,500 feet less runway "than its modern counterparts."

Constant attention to the DC-3's well-being seems to guarantee that it will be around many more years, if its old airframe doesn't give out from its renewed high living. ◆ ◆ ◆



Covered wheel wells and redesigned oil-cooler fairing are contributing factors to new high in performance achieved in the latest DC-3 modification engineering by Aircraft Engineering Co. of Detroit.

CAB Proposes New CAA Safety Rules

Civil Aeronautics Board's Bureau of Safety Regulation has proposed rule-making that would give CAA authority to designate special high-density air traffic control zones similar to one evaluated recently at Washington, D. C. in a year-long experiment.

If adopted, it would set a 180-mph (156-knot) speed limit for aircraft operating in such a zone. Also, aircraft would be required to establish radio communication before entering the high-density zone and to maintain a continuous listening watch.

An exception to this latter rule would be made for aircraft not having two-way radio. These would be permitted operation to and from airports within the zone by obtaining prior authorization from the affected control tower.

CAA's authorization under the proposal would empower it to designate airspace "not above 3,000 ft." as a high-density zone should the Administrator find traffic congestion is adversely affecting safety of operation.

ATA Group Recommends Two Types of Copters

Air Transport Association's rotorcraft committee, in its final report to ATA board of directors, recommends two categories of helicopters or other rotorcraft to meet airline's future short-haul needs.

First model recommended is a 20- to 30-passenger type having a design payload capacity of 4,400 to 5,300 lbs., range of 150 nautical miles and cruise speed of at least 125-knots. This would suit metropolitan operations where radial route systems around a large central city probably would be less than 75 miles in length.

Second rotorcraft type, intended for inter-city operation, should have a 35- to 50-passenger capacity, design payload between 8,000 and 11,500 lbs., range of 300 nautical miles and cruise speed of 150 knots, ATA group recommends.

Copies of report are available from ATA Information Director, 1107 16th St. N.W., Washington 5, D. C.

CORRECTION

The summary of airline traffic figures for June, 1956 vs. June, 1955 (AMERICAN AVIATION, Aug. 27) should have shown the following figures for Southwest Airways: revenue pass., 27,917; 25,254; change 10.5% revenue pass. miles, 5,359; 4,818; change 11.2%; total revenue traffic ton miles, 530,809; 486,763; change 9.0%; available ton miles used 50.84%.

CAB Gives Northwest New Route Privileges

Northwest Airlines has been certificated by CAB to operate unrestricted service between Pittsburgh, on the one hand, and Cleveland and Detroit, on the other. CAB also made permanent Eastern Air Lines' authority to carry local traffic, subject to a long-haul restriction, between Pittsburgh, on the one hand, and Akron, Cleveland and Detroit, on the other.

NWA's award puts it in direct competition with Capital Airlines in the Pittsburgh-Cleveland/Detroit market. "The benefits to the traveling public of a competitive service outweigh the diversion of revenue which Capital will suffer," CAB said.

"With the recent extensions of Capital's system, the importance of these markets to Capital has diminished greatly. The loss of revenue which Capital will sustain can be absorbed by the carrier without difficulty."

EAL's new permanent restriction will permit carriage of local traffic between Pittsburgh and Akron, Cleveland or Detroit on flights which originate or terminate at Roanoke, Va., or points south.

A letter from Daddy

TO: NARSHA PALMER

Dearest Narsha:

So you're back in the classroom, teaching nuclear physics at Bratberg Abnormal! I know you're happy, with all the tykes trooping up the hill to school, bringing you apples, candy, and home-made rutabaga preserves. Gosh knows, they must be happy, with an instructress who's 27, 100 lbs., 5', brown-eyed, brown-haired, and pretty as a new red top. Modern education is great, and one of the greatest things of all is how you discipline 'em without ever layin' a hand to their little backsides. Believe me, it was different when I was a kid. I got scars the size of flapjacks to prove it, too. So you won't think I'm still a dunce, I want to tell you a pilot NEVER gets through educating himself on the latest developments for safe, all-weather flying. This week, I've boned-up on literature Southwest Airmotive sent me about B. F. Goodrich products. Like the the age-old laws of physics, the principles of B. F. Goodrich design and fabrication always remain fundamentally true and reliable. Falltime for a pilot is De-Icer time and De-Icer is synonymous with B. F. Goodrich. I'm having SAC install the latest B. F. Goodrich De-Icers on my airplane, along with a new set of B. F. Goodrich's famous tires and tubes. Those items, plus my plane's B. F. Goodrich Rivnuts, brakes, wheels, and fire-resistant gas and oil coolant hose make me about as educated a flyin' man as there is in the sky. Back to De-Icers—there's only one model B. F. Goodrich can't top: My half-pint De-Icin' school marm. You're the cream of the crop!

Love, Daddy

SOUTHWEST AIRMOTIVE CO. • LOVE FIELD DALLAS, TEXAS

Circle No. 37 on Reader Service Card.

Airline Commentary

By Eric Bramley

While vacationing last month, we flew from Washington to Chicago, where we were to connect with North Central. Our Chicago connection was a comfortable 45 minutes—except that the Washington-Chicago plane was about 43 minutes late. Result: we barely made the connection, and our bag got left. It came along an hour later on NO's next flight. Attached was a sticker, headed "Courtesy Delivery," and stating: "This bag is delivered as a special service by North Central Airlines. It was not put aboard your Northliner in Chicago because (blank) Airlines did not transfer it before your flight departed." In the blank space was penciled the name of the trunkline. NO evidently believes in calling a spade a spade. We imagine there are some trunklines that are none too happy about the idea.

• • •

Here's a good example of how errors by airline personnel result in no-shows. A new agent read the following message: 726/16 B DCA ATL RODGERS ARC WILCON (the code WILCON means "will contact"). The agent made up a reservations card with the passenger's name as Wilcon. Passenger Rodgers contacted the office and because space was available, he was handled properly—never knowing his name wasn't listed on the flight. After departure, Mr. Wilcon was listed as a no-show. The reservations manager detected the error and reported the incident, adding the comment: "I may commit suicide."

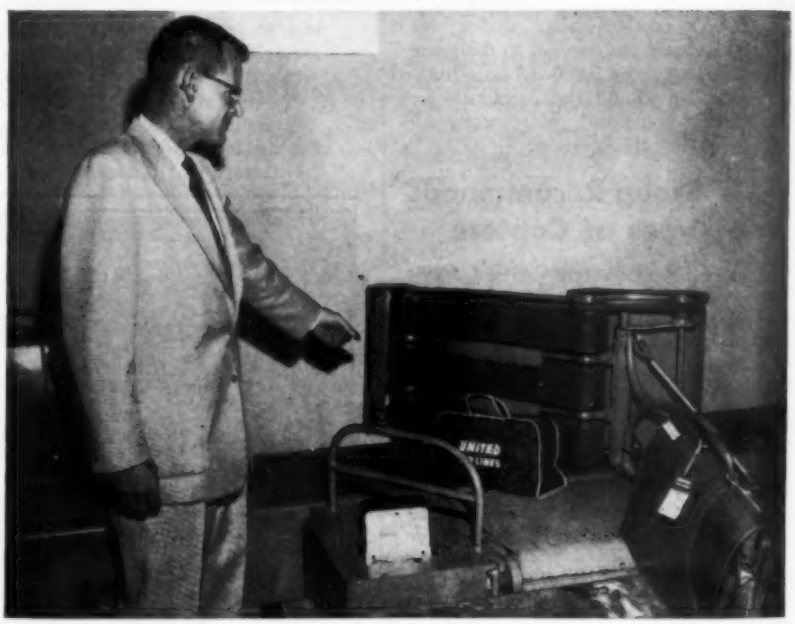
• • •

Washington's muddled airport situation was pointed up nicely by Peter Masefield, Bristol Aircraft's managing director, when he was in the city during the demonstration tour of Bristol's turboprop Britannia. Masefield drew laughs when he said he was glad to be back in Washington (he was British civil air attaché here in the mid-40's) and to see that "everything has changed —except the airport." Incidentally, during the Britannia demonstration flights, Masefield personally handled the public address system, describing the plane's performance, calling off altitude and speed during approach and landing, etc. He rates a top mark as one of the hardest-working salesmen we've seen in some time.

• • •

Siamese twins presented Delta with an unusual problem at Atlanta recently. Should they have two tickets, since they were two individuals, or only one, since they would occupy only one seat? There was no regulation covering the situation, so Delta sold them one ticket.

UAL Uses Self-Service Baggage System



A new automatic baggage self-service system has been introduced by United Air Lines at Los Angeles International Airport and similar installations are planned at other major terminals.

Installation consists of two baggage conveyor belts (60 ft. and 72 ft. long, respectively) on opposite sides of the claiming area. Running parallel to each belt is a "diverter" (bottom photo) which automatically shunts off bags at two-foot intervals. Bags slide down a metal ramp into position for pick-up by passengers.

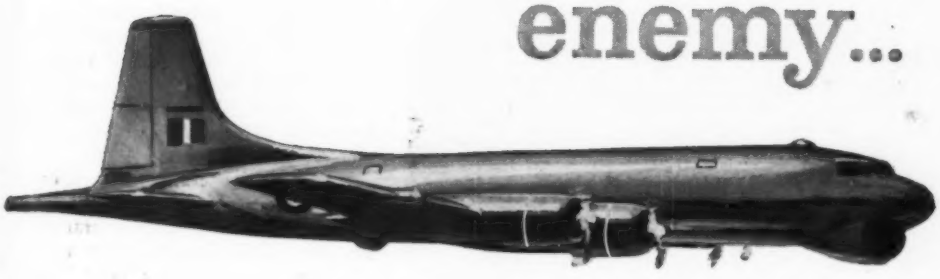
Each diverter, which is actuated by a photo-electric cell beam, travels the length of its belt in little more than two minutes (top photo), distributing about 130 bags. When the beam is broken by an incoming piece of baggage, the diverter's arm directs the bag onto a small auxiliary conveyor, from where it slides down the metal ramp.

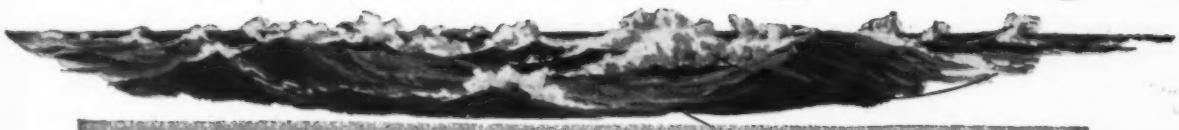
The diverter was invented by H. C. Warrington, who is employed at UAL's Denver operating base. Manufacturer is Fry Brothers, of Denver and Cripple Creek, Colo.

• • •

TWA has tied in with the Wheat Flour Institute in a "sandwich idea" contest promotion. Prize is a gourmet tour for two of Europe's finest restaurants via Super-G Constellation, plus $1,000 cash. TWA is featured in contest advertising. Tie-in was arranged by C. L. Yates, senior sales rep. in Chicago.

To seek the hidden enemy...





Soon, the oceans around Canada will be patrolled by the first aircraft developed specifically for Canadian maritime reconnaissance duties . . . the Canadair-designed CL-28.

Developed from the Bristol Britannia class by Canadair, this is the largest aircraft ever to be manufactured in Canada and we at Canadair regard it as a tribute to our capabilities that the RCAF selected us to do the job.

Size, of course, is not the only factor, for we are equally at home in the design and production of jet fighters, training planes, airliners, guided missiles or even components for other aircraft. What counts most is our outstanding record for cost performance, on-time deliveries and quality of manufacture.

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CANADAIR HAS PRODUCED MORE JET AIRCRAFT THAN ANY OTHER CANADIAN MANUFACTURER

Push-Button Light Control Saves $65,000 for O'Hare Field Tower

Tower operator at O'Hare Field controls lights remotely via new Westinghouse unit.

A Westinghouse-developed supervisory control panel for Chicago's O'Hare Field approach, runway and beacon lights saved more than $65,000 recently in facilitating a new control tower installation at that airport.

At the same time it gives tower operators push-button control over lighting for any runway, selection of approach lights at either end of the runway, and an adjustment to vary the brilliancy of lights. It also provides on-off control for the airport's wind indicator and obstruction lights.

• **Big saving** of the Westinghouse system resulted from the elimination of the need for relocating more than a mile of underground conduit from the old control tower site. All lighting transformers, switchgear and other control apparatus were situated in a vault at that location with direct wiring into a controller's console in the old tower.

By remoting the control from this vault to the new tower via a single telephone circuit, the expensive and time-consuming conduit job was avoided.

System supplied by Westinghouse is a modification of its Visicode control widely used by electric utility firms for remote operation of equipment from a central point. The airport version of Visicode utilizes two units, one at the tower and another at the vault, with a 15- by 30-inch panel as part of the tower console.

When the operator pushes a control button, the unit translates this signal into a pulsed code that is transmitted via the phone circuit to the vault. A Visicode receiver in the vault "counts" the pulses and translates them into another signal that automatically operates the desired light switch.

Once this switch operates, another coded signal is returned to the tower. It lights an indicator lamp on the operators panel notifying him that the circuit is operating satisfactorily. ◆◆◆

AA to Occupy New Facility Next Month

American Airlines' new $4,000,000 facility at the Los Angeles International Airport for line maintenance of its Douglas DC-7 equipment will be ready for occupancy in October.

After AA moves, its present hangar will be taken over by United Air Lines, doubling the size of its maintenance facility, which adjoins.

New AA hangar, embracing 200,000 square feet, will have working stations for 10 DC-7s. Ultimately, this hangar is to be enlarged to provide 14 stations. It also has been planned so that it can accommodate AA's Boeing 707 jets when they are placed in operation. Parts storage will be provided by a 41,000 square feet mezzanine served by three freight elevators. A separate structure will house commissary for Sky Chefs, Inc. and an employe cafeteria to serve 200.

Concrete parking area totals 753,000 square feet, providing space for 20 DC-7s, a washing area for four airplanes at once and other service areas. AA is installing six 50,000-gallon fuel storage and distribution tanks at the new site now and has arranged space to add three more at a later date.

Site for new facility includes 50 acres leased from the airport at an annual rental of $1,008 per acre. Location is in a new maintenance area incorporated in the Los Angeles airport's master plan.

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WEIGHT CONTROL ENGINEER

This is your chance to enjoy the exceptional professional and personal advantages of a key position at General Electric's renowned Jet & Rocket Engine Center.

Your qualifications should include a BSME degree, 3 years in design of sheet metal or machined parts, and experience in aircraft or engine weight control and aircraft gas turbine engines.

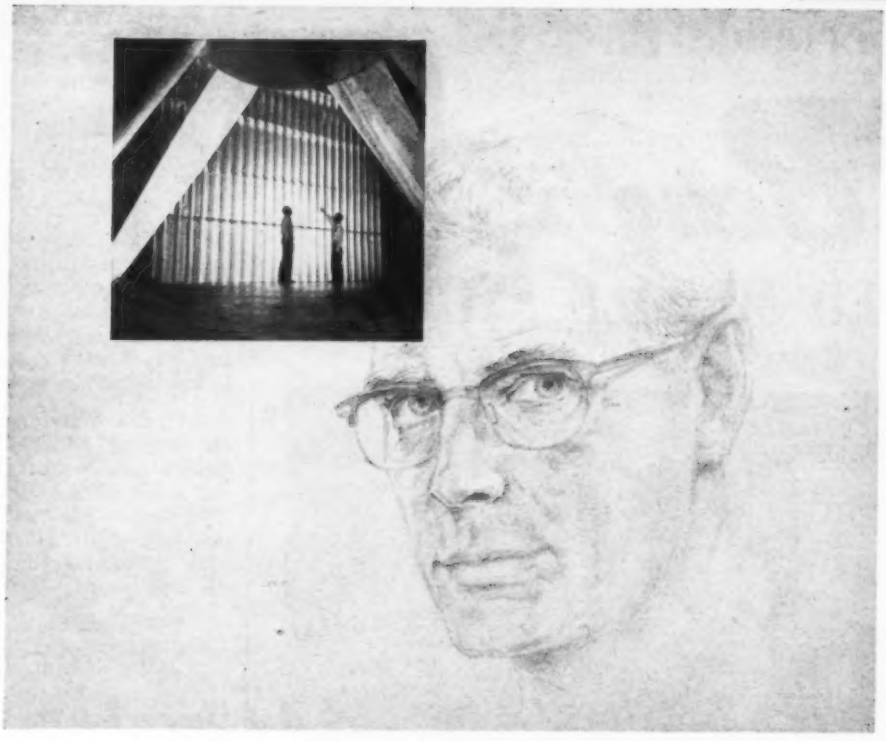
You will carry out an engine weight-control program: determining all data on weight, center of gravity, moments of inertia and loads; measuring Project Performance in meeting weight objectives; and promoting light-weight design throughout the Project. You will advance your career—at General Electric's Aircraft Gas Turbine Division.

Recruiting representatives from AGT will be in most major cities next month. Local interviews for qualified applicants can be arranged. Write in confidence to:

Mr. Mark Peters, Dept. M8-12
Technical Personnel, Bldg. 100
AIRCRAFT GAS TURBINE DIVISION

GENERAL ELECTRIC

Cincinnati 15, Ohio



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SEEKING THE CHALLENGING PROJECTS IN

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Generous travel allowances to engineers who are accepted. Write at once enclosing full resume to: H. T. BROOKS, ENGINEERING PERSONNEL DEPT. 221

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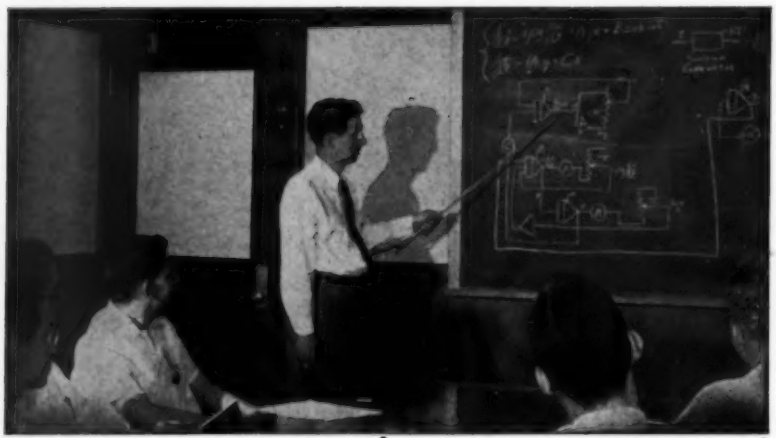

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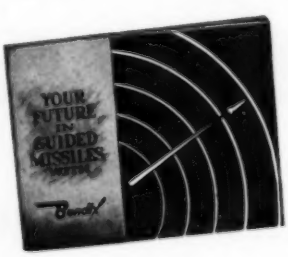

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Transport Briefs

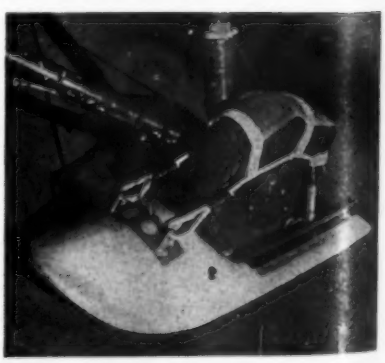
• **United Air Lines** reports six month earnings after taxes of $5,260,884, a 23% increase over January-June net of $4,373,080 in 1955. First-half operating revenues of $126,453,060 and expenses of $115,525,960 both reflected a 13% increase over last year.

• **Chilean Airline CINTA** filed tariffs with CAB providing passenger fares and cargo rates between points in Central and South America and Miami, effective Aug. 19. Carrier plans to operate C-46s between Santiago and Miami on one round-trip weekly.

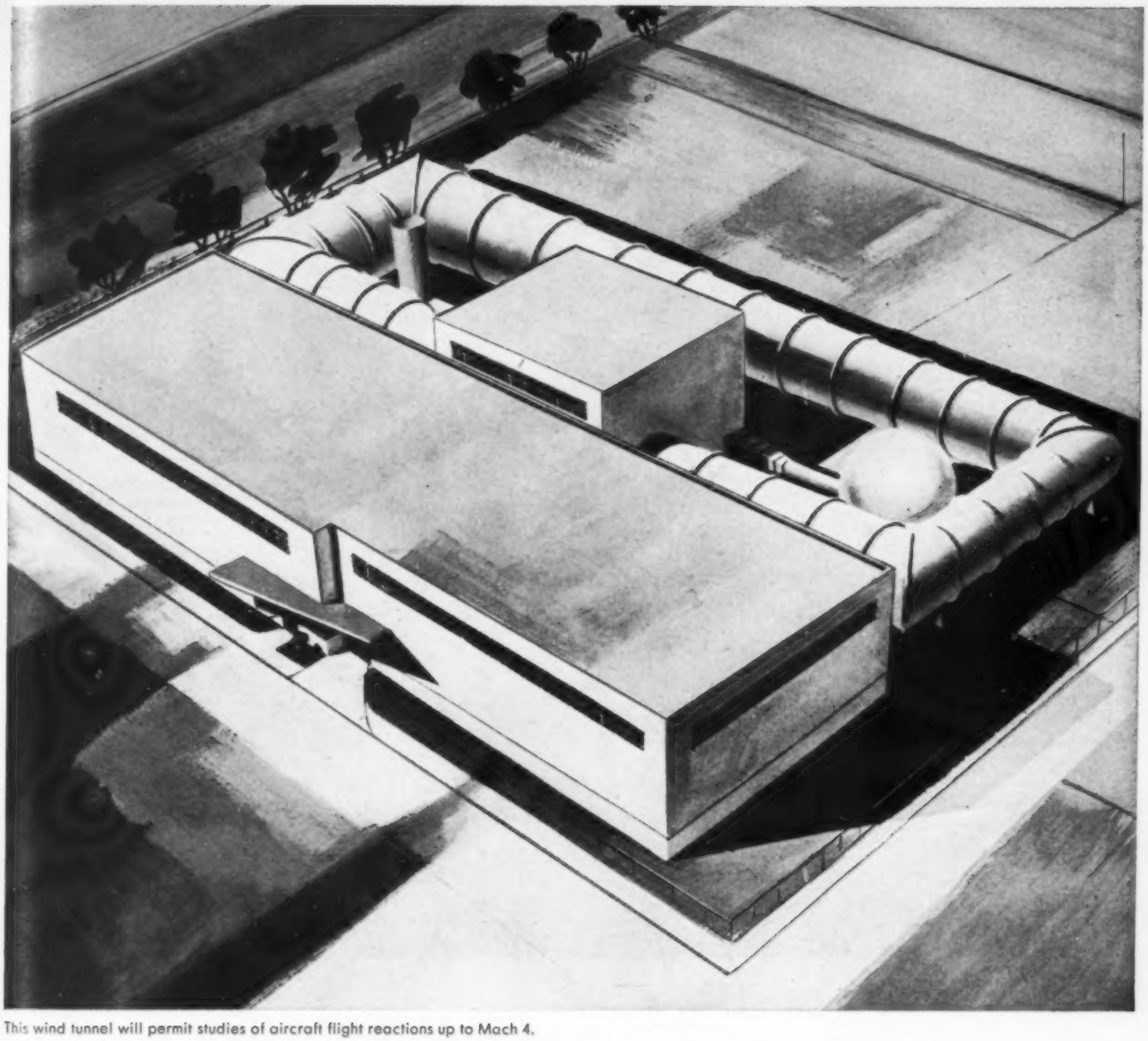
• **Trans World Airlines** reports a net loss of $5,396,000 for January through June compared with a $1,334,000 profit for the first six months of 1955. Operating revenues reached an all-time high of $112,110,000, up 13% over 1955, but expenses jumped 22% during the same period, TWA's report stated.

• **Delta Air Lines** netted $4,678,000 for its fiscal year ended June 30, more than double its $2,166,025 profit for the previous year. The 1956 net included a $1,309,000 profit after taxes on equipment sales.

Bear Paws for HOK



Snowshoes have been added to Kaman Aircraft's HOK-1 utility helicopters being used by the Marines. Shoes, developed by Kaman, are called bear paws, provide buoyant landing gear area for snow, sand and mud. Small, lightweight shoes can be carried in copter for quick field installation.



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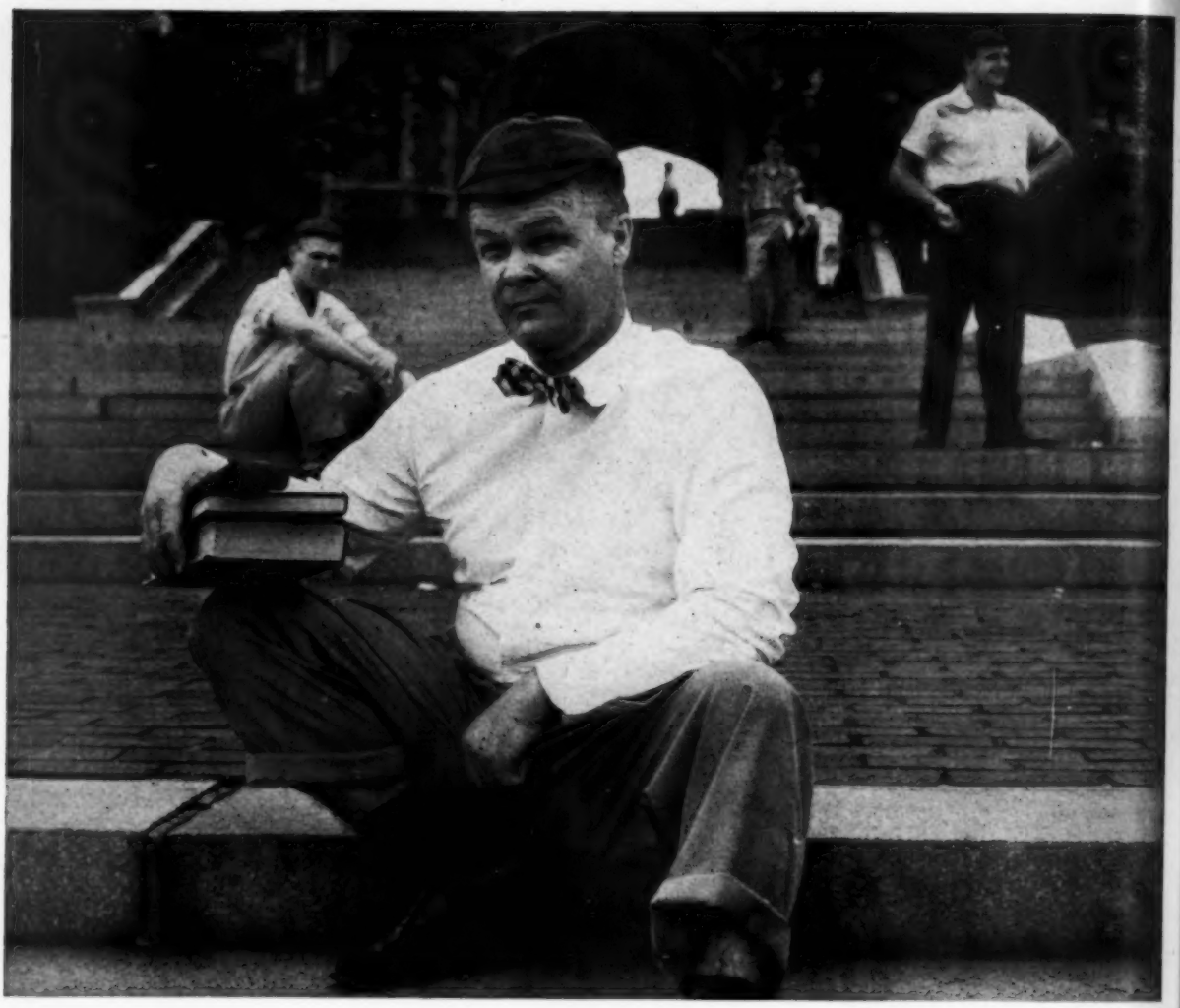

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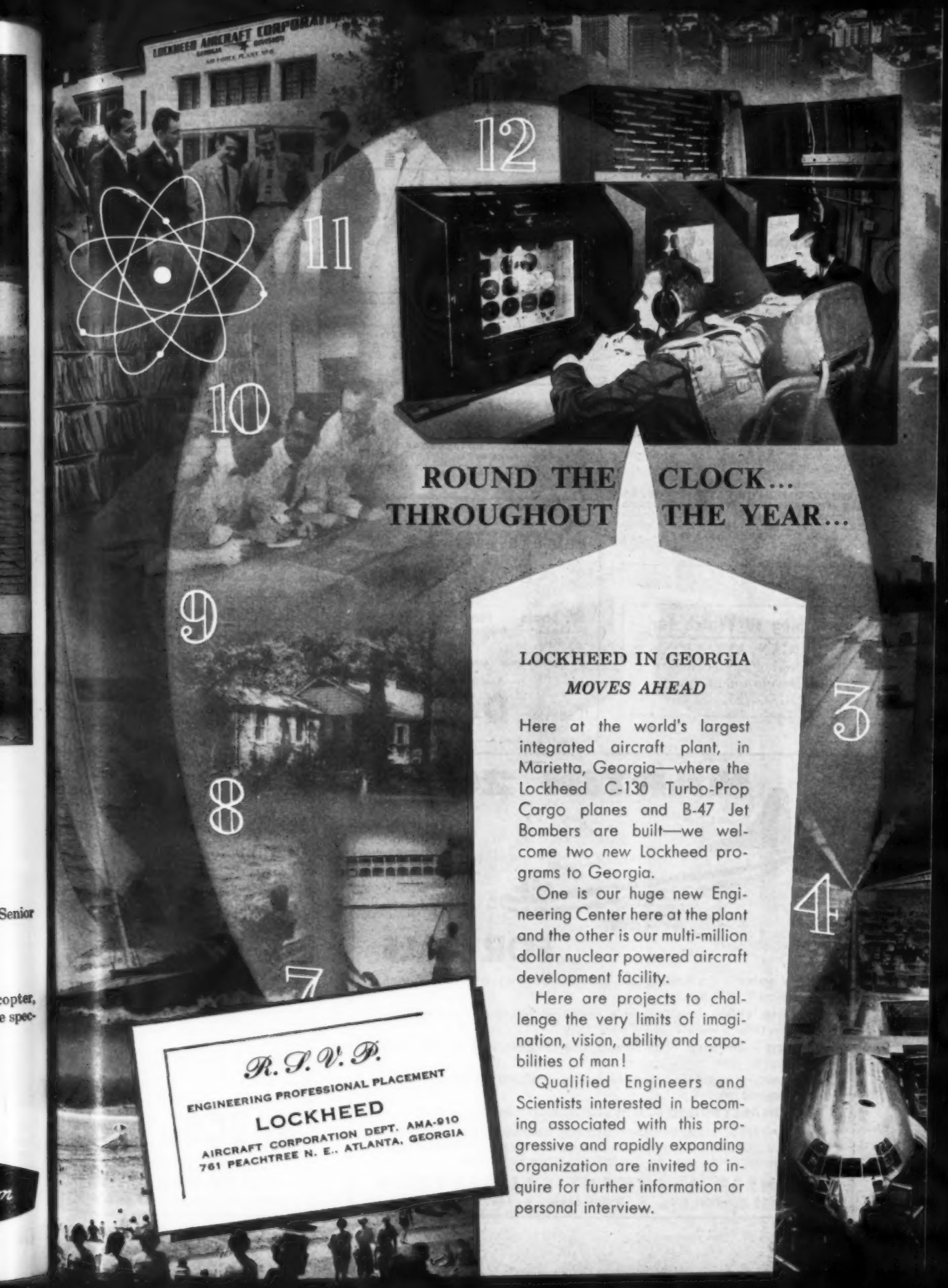

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EN ROUTE . . .

WAYNE W. PARRISH

Congo Safari: 1956 Style

Our Sabena press party lost no time in getting into the heart of the Belgian Congo. We arrived in Leopoldville on lower Congo about noon and flew early next morning in a DC-4 to Stanleyville, some 1,800 miles up the Congo across nothing but solid jungle.

Leo, as everybody down there calls it, is a boom town of some 25,000 Europeans and 350,000 natives. But I'll tell you more about it later.

Stanleyville was hot and humid. It's that way all year round although it does cool off appreciably at night. Just across the road from the airport terminal is a sizeable Sabena guest house consisting of a main building with restaurant and large open terrace and lots of cottages. The accommodations are quite good in terms of the tropics.

We arrived for lunch and were to leave early next morning by car for our long tour by road. The afternoon program called for a tour of Stanleyville, shooting the rapids, and a reception by local government and business people. The town is attractively laid out but few roads are paved and there are only a few thousand Europeans in the area.

The reason for Stanleyville is quite simple. It's at the head of navigation on the Congo and is thusly the trading focal point for a vast area. There are no railroads, only river and road transport with air links to everywhere. The tourist attraction is the long series of rapids and the Wagenia fisheries. The local natives are quite skilled in fashioning nets in the rapids and collecting a lot of fish without too much work.

Our group went to the river at the foot of the rapids and we hired two long dugout canoes, each manned by almost a dozen sturdy natives. The procedure is to try to keep yourself balanced in the boat while the natives somehow pull and push the canoe up the rapids along the river bank until they reach an open place and then paddle like mad crosswise through the strong current to an islet about midway in the half-mile-wide-river. After a rest, the canoe shoots the rapids and races the other to port.

It's quite a hair-raising experience and involves getting a little wet. The natives work up a big sweat, sing and shout while paddling, and have a great time. The body odors aren't exactly Paris perfume but the sporting thrill is one which all visitors are expected to enjoy. I guess I did. I had rather mixed emotions about it all. If you like shooting rapids, I can recommend the Congo. The river, to say the least, is impressively powerful and I'll have more to say about it later.

At both Leo and Stanleyville the natives were quite adequately clothed and I began wondering where all those picture postcards and National Geographic displays had come from. The women wrapped themselves in gay and colorful cotton prints and many men wore some sort of shirt along with tropical shorts. Civilization has really come to the Congo, I thought to myself, but I was soon to discover that the clothing was pretty well confined to towns and villages.

Next morning we started out on our motor safari, with a Ford sedan and a Ford station wagon. We were to go about 200 miles on dirt and often dusty roads to a junction point called Nia Nia.

About half-way there through the vast equatorial forest we reached a tiny village and just as our car stopped a native gal with her upper story flopping in the breeze was trotting across the road toward the market. On her back was a big pack of vegetables. With unanimity of action we all rushed to get photos of our first native in a stage of undress. The poor gal was shaking with fear and when we gave her some coins she couldn't understand why she was getting all this new-found wealth. The native onlookers cheered and laughed at her confusion.

At right is new-found friend of WWP at village in the Congo. The friend had just come in from the forest to the local market.

Driving through the equatorial forest can be both delightful and a tremendous chore. There are moments of surpassing beauty as the road winds through the dense jungle. But if it hasn't rained for a few days the roads can be terribly dusty. In any event they're so uneven that a 200-mile drive leaves you pretty well exhausted. There is also a certain monotony to the driving once the novelty has worn off because there are few villages and the suitable stops for accommodations are often a hundred miles apart. If you like greenery, there's lots of it.

I was supposed to be on a safari but my idea of a safari was packing through the somewhat open high-grass veldt on foot. But the dictionary says a safari is a journey or expedition, especially a hunting expedition. Ours was the deluxe kind, in motor cars all the way, and our hunting was for photographs and local color and scenery and native dances. We weren't exactly roughing it.

Below is WWP and Frank Bartholomew, president of the United Press Associations, surrounded by muscular natives who had rowed them to an islet in the middle of the wide Congo River at Stanleyville just prior to shooting the rapids. (Both photos by Konstantine Kostich.)

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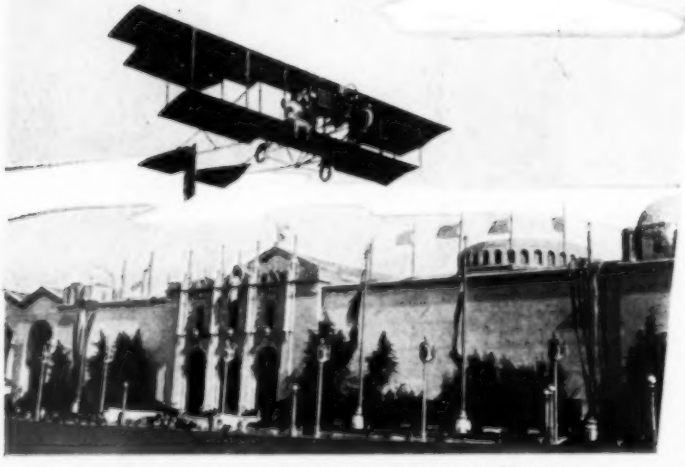
The custom of showing admiration for Art Smith's flying by giving him a medal started with a flight he made in the Black Hills in 1912. One of his most prized awards was a gold nugget, given him by his hero, Buffalo Bill.



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